A HISTORY OF MAGIC AND EXPERIMENTAL SCIENCE

VOLUMES III AND IV

FOURTEENTH AND FIFTEENTH CENTURIES

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ABBREVIATIONS

Accurti (1930)	Thomas Accurti, *Editiones saeculi XV pleraeque bibliographis ignotae: Annotationes ad opus quod inscribitur, 'Gesamtkatalog der Wiegendrucke,* Voll. I-V,' Florence, 1930, 170 pp.
Archiv	*Archiv für Geschichte der Medizin,* now *Sudhoffs Archiv für Geschichte der Medizin*
Artis auriferae	*Auriferae artis quam chemiam vocant antiquissimi authores,* Basel, 1572; *Artis auriferae quam chemiam vocant, volumen primum,* Basel, 1593; *Artis auriferae quam chemiam vocant, volumen tertium,* Basel, 1610.
Auctarium	*Auctarium Chartularii Universitatis Parisiensis,* sub auspiciis consilii generalis facultatum Parisiensium ediderunt Henricus Denifle et Aemilius Chatelain, Paris, 1894-1897, 2 vols.
Bandini, A. M.	A. M. Bandini, *Catalogus codicum latinorum bibliothecae Medicae Laurentianae,* Florence, 4 vols., 1774-1777.
Berthelot (1893)	P. E. M. Berthelot, *La chimie au moyen âge,* Paris, 1893, 3 vols.
BL	Bodleian Library, Oxford
BM	British Museum, London
BN	Bibliothèque Nationale, Paris
Boncompagni's *Bullettino*	*Bullettino di bibliografia e di storia delle scienze matematiche e fisiche,* Rome, 1868-1887, vols. I-XX.
Brunet	J. C. Brunet, *Manuel du libraire et de l'amateur de livres,* 8 vols. 1860-1880.
BU	University of Bologna library: and see Frati
Bullettino	see Boncompagni's
Carbonelli (1925)	Giovanni Carbonelli, *Sulle fonte storiche della chimica e dell'alchimia in Italia,* Rome, 1925.
CFCB	*Census of Fifteenth Century Books Owned in America,* compiled by a committee of the Bibliographical Society of America, New York, 1919.
Chartularium	Denifle et Chatelain, *Chartularium universitatis Parisiensis,* 4 vols., Paris, 1889-1897.
Chevalier	Ulysse Chevalier, *Répertoire des sources historiques*

	du moyen âge, Bio-Bibliographie, 2 vols., Paris, 1905-1907.
CLM	Codex Latinus Monacensis (Latin MS at Munich)
Codice diplomatico	See Maiocchi
Copinger	W. A. Copinger, *Supplement to Hain's Repertorium bibliographicum,* London, 1895-1902, 2 vols. in 3.
CU	Cambridge University
CUL	Cambridge University Library
Dallari, *Rotuli*	Umberto Dallari, *I Rotuli dei Lettori legisti e artisti dello Studio bolognese dal 1384 al 1799,* 4 vols., Bologna, 1888-1924.
DNB	*Dictionary of National Biography,* London, 1885-1901, 63 vols. etc.
Duhem, I (1906)	Pierre Duhem, *Études sur Léonard de Vinci: ceux qu'il a lus et ceux qui l'ont lu,* Première série, Paris, 1906.
Duhem, II (1909)	*Études sur Léonard de Vinci,* Seconde série, Paris, 1909.
Duhem, III (1913)	*Études sur Léonard de Vinci,* Troisième série, Les précurseurs parisiens de Galilée, Paris, 1913.
Duhem, III (1915)	*Le système du monde,* Tome III, Paris, 1915.
Duhem, IV	*Le système du monde,* Tome IV, Paris, 1916.
Duhem, V	*Le système du monde,* Tome V, Paris, 1917.
DWS	Dorothea Waley Singer, *Catalogue of Latin and Vernacular Manuscripts in Great Britain and Ireland dating from before the XVI Century,* Brussels, 1928 and 1930, vols. I and II. Vol. III, 1931.
Fabricius	J. A. Fabricius, *Bibliotheca latina mediae et infimae aetatis:* I have chiefly used the edition of Hamburg, 1734-1746, 6 vols.
FL	R. Biblioteca Medicea Laurenziana (Laurentian library, Florence).
FN	Biblioteca Nazionale (National library, Florence).
Frati	Ludovico Frati, "Indice dei codici latini conservati nella R. Biblioteca Universitaria di Bologna," *Studi italiani di filologia classica,* Florence, 1908-1909, XVI, 103-432; XVII, 1-171.
Gabotto (1889)	Ferdinando Gabotto, "L'Astrologia nel quattrocento in rapporto colla civiltà," *Rivista di filosofia scientifica,* VIII (1889).
Gloria (1888)	Andrea Gloria, *Monumenti della Università di Padova* (1318-1405), 2 vols., Padua, 1888.

GW	*Gesamtkatalog der Wiegendrucke,* 5 vols., Leipzig, 1925-1932; in process.
Hain	Ludwig Hain, *Repertorium bibliographicum in quo libri omnes ab arte typographica inventa usque ad annum MD typis expressi ordine alphabetico vel simpliciter enumerantur vel adcuratius recensentur,* 4 vols., Stuttgart, 1826-1838.
Hansen (1900)	Joseph Hansen, *Zauberwahn Inquisition und Hexenprozess im Mittelalter,* Munich and Leipzig, 1900.
Hansen, *Quellen*	Joseph Hansen, *Quellen und Untersuchungen zur Geschichte des Hexenwahns und der Hexenverfolgung im Mittelalter,* Bonn, 1901.
Hellmann (1917)	G. Hellmann, *Die Wettervorhersage im ausgehenden Mittelalter,* in *Beiträge z. Gesch. d. Meteorologie,* II, 169-229, Berlin, 1917.
HL	*Histoire littéraire de la France,* Paris, in process.
Klebs (1926)	A. C. Klebs and K. Sudhoff, *Die ersten gedruckten Pestschriften,* Munich, 1926.
Lami (1756)	*Catalogus codicum manuscriptorum qui in bibliotheca Riccardiana Florentiae adservantur,* Leghorn, 1756.
Maiocchi	*Codice diplomatico dell'Università di Pavia,* vol. I, 1361-1400, Pavia, 1905; vol. II, i, 1401-1440, Pavia, 1913; II, ii, 1441-1450, Pavia, 1915.
Manget	J. J. Manget, *Bibliotheca chemica curiosa,* Geneva, 1702, 2 vols.
Mehus (1759)	*Ambrosii Traversarii . . . Latinae epistolae a domno Petro Canneto . . . : adcedit eiusdem Ambrosii Vita in qua historia litteraria Florentina ab anno MCXCII usque ad annum MCCCCXL ex monumentis potissimum nondum editis deducta est a Laurentio Mehus,* Florence, 1759.
MS and MSS	Manuscript and Manuscripts.
Muratori, *Scriptores*	*Rerum Italicarum scriptores ab anno aerae christianae 500 ad 1500,* ed. L. A. Muratori, 1723-1751. New edition in process since 1900.
Pellechet	M. L. C. Pellechet, *Catalogue général des incunables des bibliothèques publiques de France,* 3 vols. (A-Gr), 1897-1909.
Recueil (1929)	*Recueil des plus celebres astrologues et quelques hommes doctes faict par Symon de Phares du temps de Charles VIIIe,* publié d'après le manuscrit unique de

	la Bibliothèque Nationale par le Dr. Ernest Wickersheimer, Paris, 1929.
Renaudet (1916)	A. Renaudet, *Préréforme et humanisme à Paris pendant les premières guerres d'Italie (1494-1517)*, 1916.
Sbaralea	*Supplementum et castigatio ad Scriptores trium ordinum S. Francisci a Waddingo aliisque descriptos*, original edition, 2 vols., Rome, 1806; revised edition, 1908, 1921.
Schum, *Verzeichnis*	Wilhelm Schum, *Beschreibendes Verzeichniss der Amplonianischen Handschriften-Sammlung zu Erfurt*, Berlin, 1887.
Soldati (1906)	B. Soldati, *La poesia astrologica nel quattrocento: richerche e studi*, Florence, 1906.
S. Marco	Biblioteca nazionale di S. Marco in Venezia (St. Mark's library, Venice).
Tiraboschi	Girolamo Tiraboschi, *Storia della letteratura italiana*, Milan, 1823-1826.
Valentinelli	J. Valentinelli, *Bibliotheca manuscripta ad S. Marci Venetiarum*, vols. I-VI, Venice, 1868-1876.
Vatic.	Biblioteca Apostolica Vaticana (Vatican library, Rome).
Verae alchimiae	*Verae alchimiae artisque metallicae citra aenigmata doctrina certusque modus scriptis tum novis tum veteribus nunc primum et fideliter majori ex parte editis comprehensus*, (auctore G. Gratarolo) 2 parts, Basel, 1561.
Zetzner	Lazarus Zetzner, *Theatrum chemicum*, 6 vols. Argentorati (Strasburg), 1659-1661. This is the edition which I have chiefly used, but some use has been made of the earlier edition of 1613, 1622, etc. It was first published in 4 vols. at Ursel, 1602.
Zinner	Ernst Zinner, *Verzeichnis der astronomischen Handschriften des deutschen Kulturgebietes*, Munich, 1925.

A HISTORY OF MAGIC AND EXPERIMENTAL SCIENCE

FOURTEENTH AND FIFTEENTH CENTURIES (CONTINUED)

CHAPTER XXXVIII

THE LULLIAN ALCHEMICAL COLLECTION

In this chapter we consider the alchemical writings which were attributed—it appears falsely—to Ramon Lul or Raymond Lull in the fourteenth and fifteenth centuries, the period covered in our present volumes. Since it has proved difficult to trace unmistakably the existence of such works back into the fourteenth century, we have delayed discussion of them until now. On the other hand, since our present survey extends only to 1500, we are not now interested in alchemical treatises ascribed to Lull which appear to have been fabricated in the sixteenth and seventeenth centuries except sufficiently to prove that fact to exclude them from this treatment. Our concern here is primarily with the more ancient portion or original—if that word may be used of pseudo-literature—nucleus of the Lullian alchemical corpus.

Hitherto the most extended and serious account of these alchemical works found under Lull's name has been that in the long article on him in the *Histoire littéraire de la France* (vol. 29). Its treatment may be described as characterized by two chief aims: to list as many such works as possible and to show in each case that the work could not have been by Lull. The result was inevitably piecemeal and negative. The author of the article had no interest in these alchemical writings except to prove them spurious and consequently irrelevant to a discussion of Lull and his writings and ideas. Our interest is rather in the writings themselves which constituted a collection of influence and importance in the development of alchemical literature and thought. Nor can they be entirely excluded from a history of Lullianism, since they evidently imitate his writings, attest his influence, and long served to swell the glory of his name. The assumption that spurious writings are worthless is one to which

the historian of thought cannot subscribe. One need not refuse to read the Pentateuch just because it was not written by Moses. Our aim, however, will not be to list as many such works as possible but rather to indicate which were the best known and most influential. We shall reduce considerably the pretentious list of titles given by the *Histoire littéraire,* partly by distinguishing between those current before 1500 and those which first appear in early modern times and so represent a different layer of alchemical thought, partly by showing that different titles listed separately by the *Histoire littéraire* often apply to a single work. The article in the *Histoire littéraire* based its account of the alchemical treatises ascribed to Lull largely upon the printed editions and late manuscripts which were limited further in the main to collections at Paris, Munich, and Vienna. We have endeavored to keep closer to the manuscript tradition before 1500, and to avail ourselves more extensively of the manuscript treasures of other libraries, notably in England and Italy.

In attempting to date the alchemical writings ascribed to Raymond Lull three general considerations may be taken into account. First, that he seems not to have believed in the transmutation of metals, and that such writings under his name are almost certainly spurious and composed after his death. Second, the fact that almost if not quite all manuscripts of such writings are of the fifteenth century or later.[1] This second considera-

[1] The *Histoire littéraire* knew no MS of such writings earlier than the fifteenth century and I have looked in vain in libraries on the continent for a fourteenth century MS. According to Mrs. Waley Singer's *Catalogue of Latin and Vernacular Alchemical Manuscripts in Great Britain and Ireland,* I, 236 and 243, Bodley 645 offers a fourteenth century text of the *Anima artis* and *De secretis nature* or *Tertia distinctio.* I presume that Mrs. Singer has reference to this MS when she remarks in *Archeion,* IX (1928), 45, "None of the numerous copies in British libraries of alchemical works bearing the name of Raymond Lull was written earlier than the fifteenth century. We have indeed encountered one volume of earlier date that contains these texts. This is an alchemical collection in a late fourteenth century hand, in which occur two of the alchemical compositions usually attributed to Raymond Lull. In this volume, however, both are ascribed to Remundus. In the colophons of these works, moreover, the dates 1319 and 1321 are given as the respective dates of composition." It is, however, quite evident from the work itself and its dialogue with the monk that the writer of the *Tertia distinctio* or *De secretis nature* represents himself as Lull who, moreover, in his genuine works often speaks of himself simply as Raymond. Mrs. Singer's distinction of names is therefore negligible. I am, however, doubtful if the handwriting of Bodley 645 is earlier than 1400. In BN fonds français 19960 (formerly St. Germain, latin 1448) which is dated of the fourteenth century in the catalogue the first item is a Latin text of the *Epistola accurtationis,* but both it and the remainder of the MS seemed to be of the fifteenth century.

tion alone would not be decisive, for there is scarcely a fourteenth century manuscript of an alchemical work by Arnald of Villanova, and yet some of the alchemical treatises attributed to him are probably genuine. Third, the fact that when such writings ascribed to Lull give a professed date of composition, it is more often subsequent to than prior to 1315, the date of Lull's death.

We possess an account of Lull's life, autobiographical in character, and a long list of his writings drawn up at the end of August, 1311,[2] towards the very close of his career. This bibliography does not comprise a single one of the titles of the many alchemical treatises which were later to appear under his name. Furthermore, in his authentic writings he definitely pronounced against alchemy and that under circumstances and in a context which seem at first sight rather favorable to the hypothesis of transmutation. This may be illustrated from a series of questions put in his *Quarta pars magna*[3] and by his answers to certain other questions put to him by Thomas of Arras. In the former case we have a succession of queries as to the action and passion of a stone followed by others as to flame and fire, with the connecting link of thought between the two chains that a spark can be struck from a stone. Let us traverse these sets of problems to put ourselves in touch with the thought of Lull and his contemporaries:

Can a stone have several passions at the same time?

Can intellect or imagination understand a stone?

Can touch apprehend the qualities of the elements in the absence of the essences of the same?

[2] BN 15450, fol. 88v, col. 2: "Isti libri fuerunt numerati in fine Augusti anno domini M°CCC°XI°."

[3] BN 15450, fol. 376 *et seq.*, "Quarta pars magna. Reductio questionum ad partem dispositivam."

Why does not touch reach the air and fire in the stone?

Can a stone move itself and, if it moves itself, what does it move itself with?

How does the intellect know that there is fire in the cold stone?

Are the elements present in the stone potentially or actually?

Can a stone be heavy and hard without earth and water?

Does jasper check the flow of blood?

Why does the magnet attract iron?

May a stone have several specific forms?

Between jasper and Saturn should we posit a medium by which Saturn acts upon jasper?

Can an object be composed of several essences differing in species?

Why does not the fire which is in the stone burn the same?

Is the flame of fire present in the stone potentially?

In a stone do the elements have their own figuration, condition, and location?

In a stone are there present several individuals?

Does one flame generate another flame?

How does a flame burn the hand when the hand is at a distance from the flame?

Is air active in receiving lucidity from the flame?

Can diverse operations proceed from one form?

Why does fire dissolve stone but not gold?

Since the flame heats water gradually, why does water quench the flame suddenly?

Has fire a triangular place in the flame?

Why is fire hotter at the peak of the flame than at its sides?

Are there air and water in the flame?

Are the elements present in the flame continuously or contiguously?

Is the genus of flame an *ens reale?*

Such are some of Raymond's queries as to the constitution of stones and flames. Occasionally they suggest present day speculation and experiment as to the composition of matter, or seem to provide a favorable basis for the development of alchemical doctrine as to the separation of the elements. It is only after numerous questions concerning vegetation, brutes, man, angels, and God that Raymond approaches the subject of metals and alchemy which is introduced by the question, how

far is man the cause of metals?[4] To the next question, whether a metal can be individualized beyond its form and matter and deduced from potentiality into actuality, Raymond's answer is negative. Raymond holds that the metals constitute a genus and thus obviates the alchemical contention that since all metals were but a single species, the art of transmutation did not require an alteration of species. He further holds that the accidents of metals are inseparable from them, and that the substance of a metal cannot be artificially individualized beyond its natural composition.[5] The qualities of metals are also inseparable and immutable. Raymond therefore concludes that alchemy is not a true science but a figment, that it is not possible by alchemy to change the natural actions and passions of the elements into other species, that alchemists have been led by observing the properties of metals into a fantastic mode of thought,[6] and that they cannot reproduce artificially the natural formation of metals.

This would seem a sufficiently extended and uncompromising denial of alchemy, but we have it repeated more briefly in the replies of Raymond to the fifty questions of Thomas of Arras. In these the question as to the possibility of artificial transmutation is led up to in a rather interesting manner. Thomas's twenty-third query[7] was whether the patriarchs of the Old Testament really lived as long as is there stated, or whether the number of years should not be interpreted as lunar months. Raymond cannot accept this chronological suggestion, since in that case we should have to admit that there had been men since who had lived longer than Methusaleh. His explanation is that the elements then were younger, fresher, and more disposed to receive celestial influences, just as new soil is more fertile than that which has been long cultivated, and also that the patriarchal

[4] BN 15450, fol. 386.

[5] The following further question and reply I have not attempted to translate: "Utrum metalla sint extra generalem quantitatem eis coessentialem? Respondendum est quod non, aliter species in quibus sunt essent sine genere quod est impossibile."

[6] "Per quem modum alchimiste habeant habitum fantasticum? Respondendum est per habitus metallorum."

[7] BN 15450, fol. 407, col. 2.

longevity was needed to multiply the human race. The next query, for whose solution Lull refers to his books on astronomy, is whether we can impede the influence of the stars in us, granting that the future can be known through astronomy as wise astronomers say it can. It is then asked if gold is corruptible, and the somewhat non-committal reply is that the alchemists say not. So far the attitude expressed might seem favorable to credulity in the marvelous and to occult science in general, and to alchemy as well as to astrology in particular. But to the twenty-seventh and twenty-eighth questions: Can human life be prolonged by nature and art? and, Can art improve the operations of nature or do anything better than nature? the answer is in both cases, No. Such, then, is the unfavorable attitude to the art of alchemy expressed in Lull's authentic writings.

In some of the treatises in the Lullian alchemical collection and elsewhere in late medieval alchemical literature an apparent attempt to explain away this opposition is made by representing Lull as converted by Arnald of Villanova from an attitude of hostility to one of belief in the art. But this has to be rejected as a transparent myth. Arnald died in 1311, in August of which year we find Raymond unwilling to confess to the composition of a single alchemical treatise. Nor does there appear to be any evidence for dating a single alchemical treatise ascribed to Lull in the years between 1311 and his death in 1315, which brings us back to the problem of the dating of the works in that collection.

In those manuscripts which I have been able to examine the alchemical treatises ascribed to Raymond Lull were less often dated than undated. In still fewer cases was a date given before Lull's death. In one fifteenth century codex the date for composing the *Testament* in St. Catherine's church, London, near the Tower, was given at the close of the *Practica de furnis* as 1302 rather than 1322 or 1332.[8] Carbonelli gives the impression

[8] FN Palat. 792, fol. 187r, "Factum habemus nostrum testamentum per virtutem de A in insula Anglie terra in ecclesia beate Catherine apud Londres versus partem castelli ante Tamusiam regnante rege Adoardo de Virideschoth (?) per dei gratiam in manibus cuius ponimus in custodia per voluntatem de

that there is manuscript evidence that Raymond read or lectured on an alchemical work—of which he fails to give the title—in the city of Genoa on February 1, 1303.[9] But Raymond's lecture of that date was on his *Ars generalis* and bore no relation to alchemy,[10] although it chances to be followed in the manuscript by an alchemical work of Rodianus.[11] Another alchemical tract ascribed to Raymond, however, the *Investigatio secreti occulti,* is dated in another fifteenth century manuscript as written at Avignon in 1309 for his disciple, Celestinus.[12] It also seems to be addressed to an Edward, presumably the king of England. But this date and the mention of Celestinus do not appear in other manuscripts of the work. What would seem yet another treatise is a *Liber de secreto secundo lapidis philosophici* which opens, "Gravissime vir Roberte . . .," and at the close of which, according to the *Histoire littéraire,* is written, "This was finished in the year 1309, in the kingdom of England, under king Rob-

A presens testamentum in anno post incarnationem millesimo trecentesimo secundo cum omnibus suis voluminibus que nominata sunt in presenti instrumento cum Cantilena que sequitur ad presens. Iehsus." This date for the *Testament* is not found in the MSS of it listed by HL and DWS.

[9] Carbonelli (1925), p. ix.

[10] Vatic. Ottobon. 31, fols. 84r-115r, rubric, "Deus omnipotens cum tua gratia et benedictione facimus lecturam artis que intitulata est brevis practica tabule generalis." Text opens: "Est autem ista lectura ad declarandum artem generalem cuius subiectum est artificium generale ad solvendum questiones. Et dividitur in XIII partes. Prima pars est de subiecto artis. Secunda est de ordine. Tertia est de docendo. Quarta de investigando. Quinta de inveniendo. Sexta de applicando. Septima de significando. Octava de probando. Nona de miscendo. Decima de multiplicando. Undecima de contrahendo. Duodecima de disputando. Terdecima de declarando." At the end we read: "Finivit Raymundus hanc lecturam in civitate Ianue anno domini millesimo trecentesimo tercio die prima mensis februarii ad honorem Iehu Christi cui hoc opus et alia sua opera commentavit de voce."

[11] Ottob. 31, fols. 117r-128v, "In dei nomine et eius matris. Opus maior Rodiani qui dicitur trium verborum. Sciendum est quod in lapide philosophorum sunt quatuor elementa. . . ." The text ends unfinished, "Unde cum corpus . . ." with the signature, "lapidis nostri," which is not continued.

[12] FN II, iii, 27, 15th century, fol. 279v-r (in this MS the numbering begins with the left hand page): "Adoarde, propter tuum amorem et ad multiplicationem fidei chatolice et ad honorem beate virginis Marie perficit magister Raimundus in Avinione in cenobio fratrum predicatorum istum tractatum de investigatione secreti occulti Celestino suo discipulo, Anno domini M°CCC° nono." BU 270 (457), II, fols. 121r-130v; "Practica Raymundi Lulli edita anno domini 1209 in Avinione. Accipe urinam . . . / . . . est absconsa," is probably the third part of the *Investigatio* and 1209 a slip for 1309.

ert."[13] But since the *Histoire littéraire* mentions neither manuscript nor edition with this colophon, and since no Robert was king of England in 1309, the date is open to serious suspicion, and the whole treatise is probably very late, although a work might have been addressed to Robert of Naples in 1309. I have found it only in a manuscript of the sixteenth century without mention of a date of composition but addressed to Edward, king of England.[14]

After 1315 a number of dates of composition are sometimes given for alchemical treatises attributed to Raymond Lull. The *De secretis naturae* or *Tertia distinctio* is variously stated to have been completed near Paris[15] or at Zamora in Spain in 1319,[16] and sometimes the date 1330 or 1333 instead of 1319 is given for its completion at Paris, while an *Ars brevis* which seems an extract from it is said to have been finished by Raymond at Pisa in 1347.[17] The *Anima artis transmutatoriae metallorum* is also diversely dated at Montpellier in 1321[18] or in 1333.[19] The *Experimenta* are dated in 1330, at least in the printed version,[20] and in one of two manuscripts.[21] But no place of composition is given, and I have found no manuscript of the *Experimenta* before the sixteenth century. The work was probably composed long after 1330. The *Testament* or a portion of it is represented as drawn up in the church of St. Catherine in London in 1332,[22] but the date is open to suspicion because an Edward of Woodstock or of Carnavon is represented as

[13] HL 29, 371.

[14] FN II, iii, 28, fols. 126r-127v: "Incipit liber de secreto secundo lapidis phylosophici compositus a divino Raymundo Lullo ad Edwardum regem Anglorum. De lapide minerali qui dicitur ovum philosophorum. Est autem alius modus nobilior transmutandi argentum vivum . . . / . . . in annis tribus cum dei voluntate. Explicit."

[15] DWS No. 255, I, 242: Milan, Ambros. D. Inf. 512, fol. 33v.

[16] HL 29, 287.

[17] DWS No. 255, I, 250.

[18] Vienna 2474, fol. 20r, "Scriptum ac datum per Ramundum Lulli apud Montem Pessulanum anno domini MCCCXXI." BN 7164, 15th century, fols. 103r-121v, "Finivit Raymundus librum istum in Monte Pesullano regnante rege Roberto anno ab incarnatione domini millesimo CCCXXI."

[19] BN 14007, fol. 80v; Berne A 78, fols. 59v-60r.

[20] Manget, I, 849, col. 1.

[21] For notices of these two MSS see Appendix 39.

[22] DWS I, 223. See too Wolfenbüttel 3076, fol. 124r.

king of England. Edward of Woodstock was never king of England and in 1332 was only two years old, while Edward of Carnavon who reigned as Edward II had died in 1327. Sometimes it is further stated that the work was translated from Catalan into Latin in the Priory of St. Bartholomew in London in 1343.[23] An *Art of Converting Mercury and Saturn into gold and of conserving the human body* is said to have been published at Rome in 1332 or 1322 by Raymond Lull.[24] A brief *Lucidarium* or *Elucidatio Testamenti* to king Robert is put at Montpellier in 1333,[25] while the *Book of Mercuries* is said to have been written in that year at Milan, where its author had resided for three years[26] but which the true Lull never visited. But sometimes the statement as to composition in St. Catherine's, London, in 1332 is found at the close of the *Liber mercuriorum*.[27] The *Epistola accurtationis* is another treatise addressed to king Robert and dated in 1333.[28]

According to the *Histoire littéraire* the *Liber naturae et lumen nostri lapidis* is dated at the end in St. Catherine's, London, 1337,[29] but it cites no manuscript for this. The only manuscript with that title which I have found is of the sixteenth century. It purports to address itself to a Charles, king of the Angles, with whom it engages in dialogue, and is said to have been composed in 1338 at Saint Catherine's, London, in the presence

[23] DWS in *Archeion*, IX (1928), 49: in DWS, No. 244, I, 230, however, this date is given as 1443. See also BU 523 (927), 15th century, fol. 85v: "Translatum fuit presens testamentum de lingua catalanica in latinam anno domini 1443, vi Iunii apud London. in prioratu S. Bartholomey."

[24] HL 29, 372, quoting Berne A 78, 15th century, which I have verified, fol. 31v. The earlier date is given in BN 12969, a MS of 1501 A.D., fol. 30r, concerning which see Hauréau, *Notices et Extraits*, II, 141-143.

[25] Vatic. 5847, fol. 97v, ". . . finita est ars transmutationis per magistrum Raymundum Lulium in preclaro studio Montispessolanis anno domini M°-CCC^{mo}XXXIII°." It is perhaps by a confusion with this that the *Anima artis*, also addressed to king Robert, is sometimes dated at Montpellier in 1333 instead of 1321.

[26] HL 29, 279. But I have found no such colophon in the five MSS of the work which I have examined.

[27] Vatic. 5846, fol. 119v, where, however, the pasting of tissue paper over the torn leaves and the ink showing through from the other side of the leaf prevented my making out all the words.

[28] HL 29, 281.

[29] HL 29, 381: "Fecimus in Sancta Catharina, Londini, anno 1337."

of the abbot, St. Bernardin, and a Dominican friar.[30] But the text itself seems to be that of the *Lily of Intelligence,* a work of which we have treated in the chapter on Arnald of Villanova. This colophon is probably an imitation of that of 1332 at the close of the *Testament.* A *Semita recta* or *Codicil,* which is not the usual text found under either of those names, is dated at its close in St. Catherine's, London, in 1346. But since it occurs only in a sixteenth century manuscript and is addressed at the beginning to king Edward but at the end mentions prince Charles of England, its dating does not command much credence.[31] Indeed later in the same manuscript we find a work which Lull is said to have given to Edward the Fifth, king of England, and his son, prince Charles.[32] Other dates that seem of no value are 1349 for a *Book of the Angels on the Conservation of Human Life*[33] and 1357, once again at St. Catherine's, London, for a *Book of the Angels of the Testament of Experiments.*[34] The only known manuscripts of these two treatises are of the sixteenth[35] and seventeenth centuries[36] respectively, and

[30] FN II. iii. 28, 16th century, fols. 84r-88r, "In Christi nomine. Incipit liber nature et lumen nostri lapidis ad Carolum regem Anglorum. Rex, scias quod spiritus domini ferebatur super aquas . . . / . . . quoniam iuro vobis me traditurum omnia secreta tibi."

[31] FN II. iii. 28, 16th century, fols. 48r-53r: "Incipit liber qui dicitur Semita recta et Codicillum vulgo nuncupatur ad regem Eduardum Anglorum per Raymundum Lullium. Serenissime rex scias quod in omnibus libris nostris . . . / . . . solida habens folia ad modum foliarum Talchi quod verum est. Factum habemus in ecclesia sancte Catherine apud Londinium vulgo Londres supradictum Codicillum presente domino meo Carolo principe Anglie anno salutis M CCC XXXXVI ad laudem Creatoris. Explicit Codicillum Raymundi Lullii."

[32] FN II. iii. 28, fols. 116r-125r, "Incipit liber appellatus de secreto occulto nature celestis compositus per illuminatum doctorem Raymundum Lullium, traditus Eduardo quinto Anglorum regi et filio suo principi Carolo. Fili charissime et amantissime gloriosus dominus deus ordinavit . . . / . . . cum auxilio dei virginisque Marie. Explicit."

[33] HL 29, 379, quoting Salzinger: Liber angelorum de conservatione vitae humanae et de quinta essentia, "Deus gloriosissimus, Deus altissimus . . . / . . . Factus est hic liber anno 1349."

[34] HL 29, 379, from Salzinger: Liber angelorum testamenti experimentorum: "Fecimus in sancta ecclesia S. Catharinae, Londini, anno salutis 1357."

[35] FN II. iii. 28, 16th century, fols. 89r-115r. "Incipit liber primus angelorum et de conservatione humane vite et de quinta essentia ad Carolum regem Anglie. Proemium in quo . . . Deus gloriosissimus, Deus altissimus, Deus magnus dedit nobis omnem scientiam. . . ." There are three books in all. The second book on healing all infirmities copies from John of Rupescissa. The date 1349 is not given.

[36] CLM 10493, 17th-18th century, a MS

the texts appear to have been fabricated then. The former was very likely suggested by the *De conservatione humanae vitae,* a work ascribed to Lull in lists of his writings in fifteenth century manuscripts and which is almost purely medical in character except for its praise of gold and *aqua permanens.* Finally, we may note that the *Histoire littéraire,* without specifying any manuscript or edition, describes a *Liber lucidarius compositus super ultimo Testamento* as written in April, 1363.[37] I have found only a sixteenth century manuscript of this work and it gives no date of composition, although it describes Lull as a monk of St. Catherine's, London.[38] It is a different work from the *Elucidatio testamenti* dated in 1333 at Montpellier.

If this group of dates from 1319 to 1363 could be regarded as authentic, we might regard the Lullian alchemical collection as having come into being during that period. At first it may impress one as a sign of good faith that these dates are subsequent to Lull's death—unless one holds that they should be interpreted as years of the era employed in Spain which in translation from Catalan to Latin have incorrectly been given as *anno domini,* in which case they would all need to be antedated by some thirty-eight years. This hypothesis, however, appears untenable, since the works are for the most part represented as composed outside the Spanish peninsula, since other genuine works of Lull are dated by the Christian era, and since years before 1307 would not fit the addressing Robert of Naples, while the king Edward would have to be Edward I. It might seem that a forger would have no object in dating after Lull's death a treatise which he intended to palm off under his name and that therefore these writings are perhaps the work of some

written at the order of Johann Wilhelm, elector palatine.

[37] HL 29, 380: "Rex serenissime et amantissime fili, pluries ac pluries me rogasti . . . / . . . Hoc fuit factum anno salutis 1363, mense aprilis."

[38] FN II. iii. 28, fols. 72r-76v: "Incipit liber lucidarius compositus super ultimo Testamento Raymundi Lullii monaci divae Chaterinae Londres. Proemium. Rex serenissime et amantissime fili pluries et pluries me rogasti . . . / . . . auro potabili soluto pro medicinis creandis. Explicit liber lucidarii de secreto auri potabilis."

other Raymond who has become confused with Lull or of followers of Lull who applied his Art to alchemical problems in the decades immediately following his death.

But other considerations, which have already been suggested in part, force one to reject this entire group of dates as unreliable. There not only appear to be no manuscript copies of the works in question which go back to that period, but even the much later manuscripts which we do have usually fail to give these dates. The statement that the *Tertia distinctio* and *Disputation with the Monk* were composed at the monastery of Benedict the Carthusian near Paris (in 1319) was probably made by someone who knew that in the list of Lull's works which has come down to us it is stated that they are scattered through the world but that he has had them assembled especially in three places, one of which is the Carthusian monastery at Paris.[39] Some of the dates and places of writing conflict with each other. Thus Raymond could not have composed books at London and Rome in 1332, if he was at Milan from 1331 to 1333. Furthermore, the historical allusions are loose and inaccurate or quite impossible. Robert of Anjou, king of Naples, is called king of the Angles or of England, while Charles, king of England, is perhaps an error for Charles of Anjou. The allusions to king Edward of England seem quite unhistorical. He is said to have sent copies of certain Lullian alchemical treatises to king Robert.[40] Elsewhere the pseudo-Lull urges him to a crusade[41] or complains that he had misspent gold which Lull made for him to use on a crusade and had imprisoned Lull himself.[42] Sometimes Edward I seems meant, and we even

[39] BN 15450, 14th century, fol. 88v, col. 1: "Divulgati quidem sunt libri sui per universum sed in tribus locis fecit eos precipue congregari videlicet in monasterio Carturiensium Parisius et apud quendam nobilem civitatis Ianue . . . et apud quendam nobilem civitatis Maioricarum."

[40] Zetzner, IV, 171, opening of *Anima artis;* Manget, I, 855, col. 2.

[41] Manget, I, 881; FN II. iii. 27, fol. 279v. These two passages, however, merely gently imply that Edward was interested in spreading the faith. More specific allusion to a crusade is seen in the *Lux mercuriorum,* FN II. iii. 28, fol. 26r, "et arma contra infideles exigere prout alias iure iurando nobis pollicitus es."

[42] *Experimenta,* xiii: Manget I, 834, col. 1. Christopher of Paris, *Elucidarius,* I, 6 (Zetzner, VI, 207), tells how grieved Raymond was when Edward used the gold he had made against France instead of Barbary. He does not say, however, that Raymond was imprisoned but that he left England in anger.

For actual imprisonment of an alchemist under Edward III, which Mr. Robert Steele regards as the basis for the Lullian legend, see DWS III, 780, and *Nature,* 129 (1932), 419.

[43] CLM 10493, Liber ad serenissimam reginam Eleonoram uxorem serenissimi regis Anglorum Eduardi: cited HL 29, 382.

[44] *Magic and Experimental Science,* II, 864.

[45] DWS No. 193, where nine MSS in England are listed. Printed *Sanioris medicinae,* 1603, pp. 264-285.

[46] In S. Marco VI, 214 (formerly Nani 55; Valentinelli, XVI, 3), 1472 A.D., fols. 287v-291v, this information is presented in a somewhat different form from any of the MSS quoted by DWS No. 193: fol. 287v, rubric, "Incipit verbum abreviatum Raymundi Gualfredi generalis ministri ordinis minorum;" incipit, "Hoc est verbum abreviatum verissimum et probatissimum de occultis philosophorum enucleatis brevi videlicet et vero sermone in operatione solis et lune. Hoc (fol. 288r) est secretum

have a Lullian alchemical tract addressed to his queen Eleanor. But this is found only in a manuscript of the seventeenth century.[43] All these associations of an author of Lullian alchemies with England have a mythical ring. So on the whole it appears that these specific dates suggested for the composition of certain treatises in the Lullian alchemical collection are late inventions of forgers or publishers who mistook the period of Lull's life and had only a very hazy notion of medieval history and the fourteenth century.

It hardly seems that another Raymond's work has been confused with that of Lull, since such a work as the *Tertia distinctio* is distinctly Lullian in manner and evidently intended to pass as his. Moreover in his works of undisputed authenticity Lull speaks of himself simply as Raymond. I therefore have abandoned the suggestion which I made in 1923[44] that the alchemical texts ascribed to Lull might have been the work of Raymond de Tarrega. There were other Raymonds who wrote on alchemy but who seem to have no connection with the Lullian collection. One is Raymundus Galfredus or Gualfredus (1250-1311), general minister of the Franciscan order, 1289-1295, to whom is attributed a *Verbum abbreviatum* or *Opus abbreviatum* which is sometimes further described as *Concerning the Green Lion.*[45] Roger Bacon is said first to have enunciated its doctrine and this Raymond to have explained it further.[46] Its explicit

sometimes states that Gaufridi imprisoned Bacon to force the secret from him, which sounds like a late invention. Moreover, Roger Bacon, in the *Breve breviarium* ascribed to him, addresses "father Raymond" and represents him as condemning alchemy.[47] There appears to be another alchemical treatise ascribed to Raymond Gaufridi.[48] After an introductory paragraph on God's creating man with a rational soul and subjecting other animals to him, and after citation of Aristotle's *History of Animals,* the text discusses *aqua vitae* and various other waters. Another work on waters, however, credits the passage on creation and citation of Aristotle to an aged philosopher (*philosophus senex*) and not to Raymond.[49] On the other hand, yet another manu-

secretorum omnium philosophorum et ortus divitiarum et aromatis ac etiam omnium thesaurorum quod qui semel metuit ulterius non egebit. Istud vero verbum adbreviatum a multis non immerito dissideratum ab egregio doctore nostro Rogerio Bacconis primo extitit declaratum. Demum ego Raymundus Gualfredi supradicti ordinis generalis minister ipsum verbum abbreviatum quam potui filiis philosophie explanare curavi. In nomine domini recipe acetum fortissimum. . . ." The treatise closes at fol. 291v, ". . . et bene preparatum pro opere supradicto, Amen."

Another continental MS of the 15th century in an Italian humanistic hand is Rome, Bibl. Casanatense, 1477, fols. 185v-189v; rubric, "Incipit opus abbreviatum Raymundi Gaufredi generalis ministri ordinis fratrum minorum de occultis philosophorum omelia etiam quod primo ab egregio doctore Rogerio Bocenis (*sic*) primo extitit declaratum. Deinde ego Raymundus brevius quam potui filiis philosophie explanare curavi." Incipit, "In nomine domini Recipe acetum fortissimum in magna quantitate . . . / . . . probatum ex secretis philosophorum etc. Explicit opus abbreviatum Raymundi Gaufredi generalis ministri ordinis fratrum minorum."

Other MSS are: Wolfenbüttel 3076 (16. 5 Aug. 4to), fols. 147r-149r, "Verbum abbreviatum verissimum et approbatum de occultis . . ."; CLM 25115, 16th century, fols. 95-102, Raymundus Gaufridi de opere lunae et solis; CLM 26059, 1507-1508 A.D., fols. 140-144, Raymundi Gaufredi de leone viridi; Cambrai 920, 15th century, fols. 115-120; Lyons 253, Tractatus Raymundi Gaufridy.

[47] *Sanioris medicinae,* p. 96: "Et tu quoque, O pater Raymunde, qui etiam solum quartum librum Metheororum credis et unica auctoritate hanc tantam talemque scientiam condemnas."

[48] Wolfenbüttel 3914 (85. Quodl. Helmst.), 1439 A.D., fols. 1-8r: opening, "Cum a principio optimo omnia consistant et debeant regulari a deo. . . ." At fol. 4r, "Explicit tractatus de virtutibus aque vite," but at fol. 8r, "Explicit ars operationis magistri Raymundi filii Gaufredi."

Heinemann's catalogue misrepresents this text as an extract from the *Theologia naturalis* of Raymond of Sebonde and as ending at fol. 7v.

[49] Wolfenbüttel 2841, fols. 138r, col. 1-140v, col. 2: "Aque ardentis virtutes mirabiles incipiunt que de vino . . . / . . . Expliciunt virtutes aque vite, sequitur ex medicinis activis. Possunt fieri aque artificiales per sublimationes. . . ." Other waters follow to fol. 144v, col. 2.

script represents even Geber as commenting "on the divine art of Raymond Gaufridi."[50]

Another Raymond, described as a knight, whose family name or place of origin is sometimes given as de Terminis, composed a series of three epistles and a *Practica* on the philosophers' stone.[51]

A third Raymond was the translator of an alchemical work from "Chaldean"—a word which in the middle ages meant Syriac or Aramaic—into Latin.[52] Since the work, although entitled *Theorica occultorum* in Raymond's translation, seems to be largely identical with the *Lumen luminum* ascribed to Rasis and

[50] Naples XII.E.15, "Geber super arte divina Raymundi Gaufridi."

[51] I have seen them in the following MSS at Bologna and Venice: BU 164 (153), 15th century, fols. 128v-135r, "Incipit epistola Raymundi de Terminis militis (not *molitis,* as in Frati's catalogue). In dei nomine Amen. Universis et singulis in arte philosophorum studentibus . . ."; fol. 130v, ". . . de nostro magisterio ignorat. Explicit epistola prima. Incipit secunda epistola domini Raymundi predicti super lapidem. Sed ob amorem vestri, domine Francisce . . ."; fol. 131r, ". . . est de secundo ordine. Modo ponit magisterium tertii ordinis"; fol. 132r, "adinvenisse letabitur. Explicit secunda epistola domini Raymundi de Terminis nobilis militis (*molitis* in the MS). Incipit tertia epistola ipsius domini Raymundi super lapide philosophico"; fol. 134r, ". . . in secula seculorum. Amen. Explicit ultima epistola. Incipit practica precedentium epistolarum. Si tu vis conducere illud quod est in ampollerea incerata . . ."; fol. 135r, ". . . et erit perfecta medicina. Deo gratias, Amen. Explicit practica dictarum epistolarum. Deo gratias, Amen." At fol. 132r, "unde ego Raymundus de Terminis miles."

S. Marco VI, 215 (once Nani 56; Valentinelli XVI, 4), 1475 A.D., fols. 235v-250v: "Incipiunt epistole Raymundi militis. Universis et singulis in arte philosophorum studentium. . . ." At fol. 240v the first letter ends as in BU 164; at fol. 241r the second opens, "Sed ad instantiam et ob amorem nostri domini Francisci volo. . . ." At fol. 245v the second letter ends and the third begins, but no *Practica* follows the close of the third letter at fol. 250v. Instead there follows an "Epistola cuiusdam philosophi."

See also Lami (1756), p. 270.

I have not seen Cambrai 919 (818), 14th-15th century, fols. 114-117: Raymundus de Terminis miles, Practice seu tractatus exordium super lapide philosophico conficiendo et super eiusdem multiplicatione methodus, opening, "Amicum induit qui iustis amicorum precibus . . ." which is likewise the incipit of the medical *Practica* of Platearius.

[52] Cues 299, 14th century, fols. 85r-96v: "Prologus. Proles succedit semper . . ."; the text opens, "Cum de sublimiori atque primo rerum effectu . . ." and ends, ". . . universaliter laude digna. Explicit tehotorica occultorum Ramundi civis Masiliensis a caldeo in latinum translata."

others,[53] this Raymond probably wrote before 1300. He is described as a citizen of Marseilles, but to identify him with the Raymond of Marseilles who in 1140 drew up planetary tables[54] might be dating such an alchemical translation too early. His *Theorica occultorum* occurs in a fourteenth century manuscript together with the *Summa* of Geber[55] and the alchemical *De anima* attributed to Avicenna.[56] The author resembles both Geber and Raymond Lull in his frequent reference to his other books.[57] That of the seventy or seventy chapters is most often mentioned[58] and indicates that the author whom Raymond translates is or pretends to be Geber. In any case there seems to be no connection between this translator Raymond and the author or authors of the alchemical treatises ascribed to Raymond Lull.

An impressive feature about the works which go to make up the corpus of alchemical works ascribed to Raymond Lull is that so many of them are continuations, supplements, sequels to, or abbreviations and explanations of others in the same collection. The pseudo-Lullian alchemy, in other words, pyramids upon itself and raises a towering edifice upon a not very broad or solid foundation. A number of treatises in the collection are

[53] The incipit of the text is the same. At fol. 85r, bottom margin, is written: "Incipit liber luminis luminum Are (stotilis) secundum quosdam Rasis philosophi in arte alkimia in quo thesauri secretorum nature occultantur. Capitulum primum." See DWS No. 113.

[54] C. H. Haskins, *Studies in the History of Medieval Science,* 1924, pp. 96-98.

[55] Cues 299, fols. 50v-74v, col. 2, with an alphabetical index in five columns on fol. 75r-v: "Incipit liber Kfber (i.e. Ieber) de summa collectionis complementi secretorum nature. Totam nostram scientiam . . . / . . . ad artis igitur excelse perquisitionem hec dicta sufficiant. Explicit liber ubi continentur omnia secreta nature. Explicit liber 37bri (?). Explicit liber Kfbfr" (i.e. Ieber).

[56] Cues 299, fols. 1-49v, opening, "In illius nomine qui maior est dominus totius mundi dixit Abuhali Abincene istum librum feci in anima et nominavi eum librum de anima. . ."

[57] The preceding tract in the MS, which opened at fol. 76r, "Cogitamini (Cogitanti mihi?) de magisterio philosophorum quidnam esset et an aliquid posset . . ." ends at fol. 84v, "Explicit liber qui intitulatur sic liber de modis legendi libros nostros." In our treatise, at fol. 87r, "quemadmodum noster disciplinarum liber edocuit," ". . . in libris nostris"; fol. 87v, "Non minus quoque in alkimistarum libro perfectum insinuavi fermentum."

[58] Cues 299, fol. 85v, col. 2, "quod totum in libro qui de lxx inscribitur"; fol. 86v, col. 1, "nec in hoc libro nec in libro lxx"; fol. 95r, col. 2, "quam in lxx capitulorum volumine descripsimus."

almost entirely made up of citations of its other texts and of repetition of their contents. This suggests that some are considerably later than others, for we can hardly believe that a single author would have kept abbreviating and commenting upon his previous works to such an extent. The zest with which this fruitless recapitulation was pursued is amazing, but after all endless repetition of the same ideas is a general feature of the literature of transmutation in our period, whose alchemists displayed little inventive capacity even in the titles of their works.

Since the works of the Lullian alchemical collection cite one another a great deal, it might be supposed that they could be arranged in chronological order on this basis. But even in genuine works of a known author this is a precarious method because cross references were sometimes inserted in an earlier work to a later one. Even more does this method seem to run riot in the treatises of the pseudo-Lullian alchemical collection, especially as we have them in late manuscripts and later printed versions. Thus the *Codicil* cites the *De intentione alchimistarum*[59] and in its turn is cited by that work.[60] The *Codicil* not only cites the *Testament,* as would be expected, and *De intentione alchimistarum,* but also the *Questionarium* which forms a section of *De secretis naturae seu de quinta essentia.* But this work in its turn cites *Codicil* as well as *Testament,* and seems further to refer to the *Anima artis transmutatorie,* which more than once cites it. A book of experiments is cited by both the *De secretis naturae* and *Anima artis,* but the *Experiments* which have reached us are obviously a late compilation from other works of

[59] Manget, I, 897, col. 2, "Vade ad tractatum de intentione alchymistarum quia ibi de ista materia et de aliis digestionibus ad plenum tractavimus. Quamobrem recapitulare hic ea non intendimus nisi quantum immediatas operationi fuerit expeditus." This would seem a clear indication that the author had already composed the *De intentione alchimistarum.*

[60] *Verae alchimiae doctrina,* Basel, 1561, II, 148, "Hunc lapidem philosophicum docet facere Raymundus in suo Codicillo seu Vade mecum per eum transmisso ad regem Angliae Eduardum." This statement sounds like a note or gloss made by some reader in his copy of the work and subsequently embodied in the text. I did not notice it in the text of *De intentione alchimistarum* in Vienna 11342, 1515 A.D., fols. 11r-30v.

the Lullian alchemical collection. *Apertorium* is another title cited in the works of the collection which seem older than it. Such citations must therefore be regarded with caution, although we may draw some inferences from them. Moreover, the pseudo-Lullian alchemical works so seldom cite any works outside of that collection that we can learn little as to their absolute date from any of their citations.

Much more helpful in forming some idea as to the relative antiquity of the treatises on alchemy attributed to Lull are dated or dateable manuscripts of the same, lists of them in other manuscripts, and the character of the treatises themselves. Lists of alchemical treatises ascribed to Raymond Lull are given in two manuscripts of the fifteenth century now respectively at London and Florence in the Sloane and Ashburnham collections, and in a *Conversation of Philosophers* in a manuscript of 1475 at Venice.[61] Collections of the treatises themselves are found in a manuscript at Oxford of 1454, in Florentine codices of the fifteenth century, in a great Vatican manuscript of 1496-1500 which has since been divided into two volumes, and in other manuscripts of the fifteenth century at Bologna, Venice, and Vienna. These lists and collections demonstrate that a very considerable Lullian alchemical corpus had taken form by the fifteenth century at least. On the other hand, certain manuscripts of the sixteenth and seventeenth centuries contain alchemical treatises which profess to belong to the Lullian corpus but which are not found in the lists and manuscripts before 1500 and which therefore will not be included in our present survey. The gulf between these two groups of professedly Lullian works is particularly marked in two companion volumes of the same size of the Magliabechian collection at Florence, one a manuscript of the fifteenth century in medieval hands and finely illuminated,[62] the other a sixteenth century codex in a cursive modern hand and with no illuminations.[63] The fifteenth century codex

[61] BM Sloane 75, fol. 185v; FL Ashburnham 190, fol. 67r; S. Marco VI, 215 (Valentinelli, XVI, 4), fols. 155-158.

[62] FN II. iii. 27.

[63] FN II. iii. 28.

contains nearly a score of alchemical tracts ascribed to Lull, almost all of which are found repeatedly in other manuscripts and lists of the same century. The sixteenth century codex adds over a score of new tracts which with one or two exceptions are not found in earlier manuscripts. Some of them bear titles identical with or analogous to those of previous treatises in the Lullian alchemical collection, but the texts are different. The obvious inference is that we have to do with a sixteenth century effort to enlarge the Lullian corpus and perhaps with the concoction of a manuscript for sale to some prince who was interested in alchemy and Lull. Some of the treatises composing it appear again in a like collection made at the close of the seventeenth and beginning of the eighteenth century for the elector palatine, Johann Wilhelm (died in 1716), and other new titles are added. This elector also had copies made of various works ascribed to Lull in earlier manuscripts of the Sorbonne and sent Büchels to Florence and van Eyck to Barcelona to search for others.[64] Thus the pseudo-Lullian alchemical collection continued its evolution in manuscript not only after the invention of printing, not only after the close of the period of our present investigation in 1500, but even after the printing of alchemical works themselves had gotten well under way. These later fabrications sometimes have fantastic titles such as "The Book of the Angels of the Testament of Experiments," "The History how Raymond Lully, count of Majorca, learned the science of transmutation and how and why he crossed to England to king Robert," and "The Book of the Secret Science of the blessed John the Evangelist." But they will not concern us in the present volume.

It is less easy to decide when alchemical treatises began to be composed under Raymond Lull's name. None are cited by John of Rupescissa who writes in the middle of the fourteenth century, or by John Bumbeles or Dombelay in his works of 1384 and 1386. The earliest such citation would seem to be by William

[64] Adam Gottron, *L'Edició maguntina de Ramón Lull,* Institut d'Estudis Catalans, vol. I of *Estudis de Bibliografiá Luliana,* Barcelona, 1915, pp. 29-30.

Sedacerius, if we accept 1370-1378 as dates when he flourished. But the work ascribed to him may have been composed much later, or its reference to Lull have been interpolated subsequently. Perhaps it is safest to date the first formation of a Lullian alchemical corpus rather late in the fourteenth century. Or possibly the *Testament* and *Codicil,* whose chapter incipits are sometimes cited in Catalan by other treatises of the collection, had appeared in that language before 1350 but were not circulated in Latin until later. A natural supposition is that either a single work such as the *Testament* or a group of alchemical treatises which were composed or appeared at about the same period served as a nucleus to which as time went on further works were added, some in the nature of commentaries upon the earlier writings or of abbreviations and revisions of them, others rather transparent forgeries prompted by the continued popularity of the alchemical collection formed under the attractive name of Raymond Lull.

The statement that Arnald of Villanova converted Raymond Lull to a belief in alchemy by resolving his doubts and difficulties is already found in the *Codicil.*[65] The treatise *De aquis et oleis,* also called *Ars operativa,* divides into four sections. Two of these Raymond says are not his own but received from king Robert under secret seal, which "experiments" Robert had in his turn from Arnald of Villanova,[66] from whom Raymond further professes to have learned many marvels and secrets.

[65] *Codicil,* cap. 63: Manget, I, 908.

[66] FL Ashburnham 1448, 15th century, fols. 35r-v, "Tractatus Raymundi de aquis et oleis incipit. Cum ego Raymundus Ylerde existens essem rogatus a quibusdam caris amicis meis. . . . Unde nota quod iste tractatus in quatuor divisiones dividitur quarum prima et quarta non fuerunt michi Raymundo revelata ut sunt 2ª et 3ª, ymo eas recepi et habui a serenissimo rege Roberto sub secreto sigillo que quidem experimenta ipse habuerat a peritissimo doctore Arnaldo de Villanova . . ." etc. It is printed in *Practica compendiosa artis Raymundi Lul.,* Lyon, 1523, Explanatio compendiosaque applicatio artis illuminati doctoris magistri Raymundi Lull ad omnes facultates per reverendum magistrum Bernardum de Lavinheta artium et theologie doctorem lucubrata et ad communem omnium utilitatem edita, at fols. 174v-180r as *De arte operativa medicine:* "Cum ego Raymundus Hylerde dudum existens rogatus affectuose a quibusdam meis charis ut eis quedam medicine artis occulta . . . / . . . Item hoc sperma bibitum alleviat hominis membra aggravata."

But these secrets, like the *Ars operativa* as a whole, are medical rather than alchemical and so do not imply that Raymond learned alchemy from Arnald. We find the Lullian legend fully formed by the middle of the fifteenth century at the latest, when William Fabri, writing to Felix V, antipope from 1440 to 1449, cites the treatise of Raymond to king Robert in which he prefers prison to revealing the secrets of the art. And king Edward of England is represented as having travelled the world over in pilgrim's garb searching for the philosophers' stone, and offering to divide his realm between Arnald, Raymond, and John "de Testym."[67]

The total number of treatises in the collection, especially before 1500, has been somewhat exaggerated not only by the inclusion of late forgeries which found their way into printed editions and bibliographies, but also by needless multiplication of titles, which do not always correspond to distinct texts. Confusion has been created by the fact that many works in the collection bear alternate titles like *Codicil* and *Vade mecum,* or *De secretis naturae* and *De quinta essentia,* one or the other of which is identical with that of some other treatise in the collection or outside it, and that prohemiums, dedications, and stock pious opening phrases have made identification by a distinguishing incipit difficult. *Anima artis transmutatorie* and *Compendium animae transmutationis* are really one and the same, as are *Compendium artis magicae* or *Compendium artis alchimiae, Compendium quintae essentiae,* and *Magia naturalis,* while the *Book of Mercuries* is identical with the *Liber ad faciendos mercurios,* the *Elucidatio testamenti* with the *Lucidarium,* and the *Conclusio summaria* with the *Repertorium.*

A number of treatises in the alchemical collection attributed to Raymond Lull open with what we may describe as a stock, late introduction, alluding to the many other works on the art which he has written and seeming to show that the collection has already come into existence, and that the writers are cogni-

[67] Carbonelli, *Sulle fonti storiche della chimica e dell'alchimia in Italia,* 1925, p. 90. BU 138 (104), fol. 253r.

zant of that fact. It is true that already in the *Testament* we find allusion to "our books" and the "many words and places of our volumes,"[68] but the implication is perhaps not quite so pronounced there. Moreover, the fact that these introductions are so much like one another is a suspicious circumstance and suggests that several successive forgers have followed a form which seemed to them appropriate to Raymond Lull. The *Elucidatio Testamenti, Clavicula, Epistola accurtationis,* and *Lux mercuriorum* all have introductory paragraphs of this type. The *Elucidatio* states that "although we have composed many books" of diverse operations in our art, yet we prefer this last book to the others, because what we hid in prolixity of words in our *Testament* and *Codicil,* we show here very briefly and clearly.[69] The *Clavicula* explains that "we have called this work our *Key,*" because our other works cannot be understood without it. The author has written many and prolix works, obscure and divided into sections, as he proceeds to illustrate from his *Testament,* treatise on the fifth essence, "and other books made by me."[70] The *Light of Mercuries* addresses some monarch, to whom the author professes to have spoken long since on transmutation and to have transmitted many volumes upon the subject. Now he adds the present treatise in order that the king may have full understanding of the others even to their most obscure passages.[71] Finally, the *Epistola accurtationis* begins, "Since I, Raymond of the island of Majorca, already in times past have composed many books on the art of transmutation."[72] The author mentions particularly the book, "of all books the most secret," on the composition of precious stones according to their virtues—the

[68] *Testamentum,* caps. 39, 64 and 67: Manget I, 732, col. 1: 746, col. 2: 749, col. 2.

[69] Manget, I, 823, col. 1, "Quamquam plurimos libros diversarum operationum nostrae philosophicae artis composuimus, . . ." etc.

[70] *Ibid.,* I, 872, col. 1, "Nos appellavimus opus hoc nostrum Claviculam quia sine hoc presenti libro . . ." etc.

[71] Vatic. 5847, fols. 103r-104v; Manget, I, 824, col. 2, "Iamdudum rex serenissime de transmutatione omnium metallorum locuti sumus et plura a nobis volumina sacratissime maiestati tue transmissa sunt. . . ."

[72] Manget, I, 863, col. 2-866, col. 1, "Cum ego Raymundus de Insula Majoricarum iam praeteritis temporibus plures libros in arte transmutationum composuissem. . . ."

most difficult of all arts—"which I transmitted to you, king Robert, in vulgar speech that you might be informed how to go to work, since all experimental science is deceptive." The book on the composition of precious stones thus alluded to is perhaps the *Lapidarius* or the *Compendium animae transmutationis* which devotes some space to this topic, but the making of artificial gems is treated in almost the same way in several works of the Lullian alchemical corpus. The writer of the *Epistola accurtationis* then departs somewhat further from the accepted form of introduction in the other three treatises by declaring all his previous works clear rather than obscure or difficult. He has tried to write all his books so that no one would fall into error, "as you know to be the case in our *Testament* and *Apertorium,* where I have treated in the clearest language everything which can be done by art." However, he has kept receiving letters from the king, first at Vienne, then at Salerno, asking for a briefer statement than in his other works and an expression of preference as between the animal, vegetable, and mineral stones. The author protests that all abbreviation is a diminution from perfection but proceeds to gratify the royal demand. This introduction is somewhat more artful than the other three and shows more acquaintance with the facts of Lull's life, such as his attendance at the council of Vienne in 1311. It would seem, however, to be pretty late, for it cites the *Liber conservationis humanae vitae.*[73] In any case, all four introductions agree in this, that they are trying to justify the writing of another brief work by Raymond Lull when there are already so many volumes by him in existence. Just as our recent discoveries and new theories in physics must run the gamut of innumerable expositors and popularizers, who will escort us within the atom or make plain the quantum theory and relativity, so the fifteenth century had to have its Lullian alchemy rehashed at frequent intervals.

The *Testamentum novissimum,* which for other reasons is obviously a quite late forgery, has much the same sort of in-

[73] Manget, I, 865, col. 1.

troduction.[74] Instead of the king Edward or Robert of England or Naples of some of the treatises of the Lullian collection, a prince Charles is addressed through whom the writer felicitates himself on renewing his interrupted friendship with that prince's illustrious father. To help Charles spread the Catholic faith and expel those who rebel against it the author, now on his deathbed, transmits to him clear and complete "the mastery diffused by us in many volumes of books under philosophical concealment."[75] After the *Testament* and *Codicil* and *Explanation of the Testament,* this *Most Recent Testament* must be regarded as rather a *reductio ad absurdum* of the last will and testament device. Another circumstance which convinces us that the *Testamentum novissimum* not only is not by Raymond Lull but is not by the author of any of the other alchemical works ascribed to him, is that, while it makes a great many citations from them, and usually, with a great appearance of scrupulous care and precision, gives the opening words of the chapter it professes to cite, not one of these many citations agrees with an actual incipit of any chapter of the works cited. The author of the *Testamentum novissimum* has simply fabricated his citations without bothering to refer to the work cited. I have seen no manuscript of the *Testamentum novissimum* itself, and it was not improbably fabricated after 1500. Its addressing a prince Charles of England is a feature of several other pseudo-Lullian alchemical treatises which seem to be not earlier than the sixteenth century. Those manuscripts mentioned by the *Histoire littéraire* in connection with it have turned out, in those cases which I have been able to examine,[76] to be copies of the *Testament* proper, with which the *Histoire littéraire* carelessly confused it. This confusion has been largely due to the fact that Manget printed as the practical portion of the *Testamentum novissimum,* following its obviously late *Theorica,* what is really

[74] The work opens (Manget, I, 790), "Cum ad nos venisti, dilectissime fili ac princeps, in tali casu et mortis articulo valde quievit anima mea. . . ."

[75] Manget, I, 790.

[76] This is true of Vienna 5487 and BN 14008; École de médecine Montpellier 469 I have not seen.

the *Practica de furnis* which is a much earlier member of the Lullian alchemical collection and perhaps goes with the original *Testament.* At least at its close Manget printed the colophon stating that the *Testament* was composed in London in 1332, and this occurs at its close in the manuscripts as well. It is because of this confusion in the past that we have here distinguished the *Testamentum novissimum,* which otherwise seems not to belong in our consideration of the Lullian alchemical corpus as it had taken form before 1500.

On the whole, we get the impression that the *Testament, De secretis naturae seu de quinta essentia,* and *Lapidarius* are probably the oldest members of the Lullian alchemical collection, and that they were quickly followed by the *Magic Art* and *Codicil.* The date of *De intentione alchimistarum* and its relation to the collection are problematic. This is also true of the *Apertorium,* although it seems later, while such brief compilations as the *Anima artis* and *Accurtatio* naturally came after the works which they abbreviated. Other treatises are apparently still later. We shall therefore consider the various works composing the collection in somewhat this order.

The chief contribution of Raymond Lull to modern science, or at least his chief step in the direction of scientific method, was his use of letters of the alphabet as brief handy designations for various substances and concepts. This employment of symbols is also characteristic of many of the alchemical treatises attributed to him, and they further comprise the trees and figures, triangular and quadrangular, in varied colors, which are features of his *Ars magna.* It is this characteristic and the practice of mutual citation which chiefly distinguish the works in the pseudo-Lullian alchemical collection from other treatises on that subject and bind them together into something like a unified corpus, although not every treatise of the collection has both these distinguishing marks. The artificial production of gems is a theme which is treated in several different works of the Lullian corpus in practically identical fashion: namely, in the *Lapidary, Book of Mercuries, Tertia distinctio* or *De secretis*

naturae, and *Anima artis transmutationis.* The alchemical writings also repeat certain scholastic conceptions or phrases which are common in Lull's genuine works such as *ens reale, humidum radicale,* and *humidum nutrimentale.* To a certain extent they imitate his tricks of style, notably his custom of opening his writings with a complicated invocation of the Godhead such as, "God with thy most holy wisdom, truth, and unity . . ." or, "God with thy grace, benediction and unfailing aid." So in the alchemical collections we have such incipits as: "God, thou who existeth gloriously omnipotent . . ." or, "God, in the virtue of thy holy Trinity in which the unity of thy divinity is in no wise wounded or confused . . ." or, "In the name of the holy Trinity and eternal unity." The genuine *Ars Magna* divides into a *Theory* and a *Practice* like many of the alchemical writings.

It must further be confessed that a more congenial model for alchemical forgers to imitate could hardly have been found than the genuine Lull, a man like them with a cause, a would-be reformer and semi-fakir, with his ardent desire to spread the principles and methods of his *Ars magna,* a desire which found expression in numerous works and disputations addressed to or engaged in with various persons but all of which tend to repeat the same sort of thing and to allude to his previous writings on the subject.

The *Testament* seems in many respects the keystone or backbone of the Lullian alchemical collection. In the larger sense of the word it is a cluster or series of treatises. After a theoretical section in almost a hundred chapters which seem essentially the same in the printed and manuscript texts[77] comes the *Practica* whose extent and arrangement is a less easy problem. Mrs. Waley Singer, on the basis of three British manuscripts of the fifteenth century embodying what she regards as "the most convincing version of the *Testamentum*" has analyzed it as "composed of the following distinct works":[78]

[77] In Zetzner there are 96 chapters; in Vatic. 5846, 97; in Vienna 5487, 92. FN Palat. 792 does not number its chapters but they largely parallel the headings of the printed version.

[78] *Archeion,* IX (1928), 46-49.

a. Tractatus practicalis secunde partis Testamenti
b. Liber faciendi mercurios et elixiria illorum
c. De medicinis pro humano corpore
d. De furnis et vasis
e. De elementis
f. Epilogue or colophon.

In the narrow sense the *Testament* might be limited to its *Theorica* and to the item indicated above as "a" as its *Practica.* The fact, however, that the colophon for the *Testament* does not occur after "a" but only at the close of the later items suggests that they too are to be included.

In manuscripts of libraries on the continent are found similar but not identical arrangements to that proposed by Mrs. Waley Singer. Her "a" is commonly followed by "b," but "c" is not found as a distinct work but simply as chapters of the *Book of Mercuries,* or, in one manuscript as chapters of a *Liber de mercurialibus ad rubeum* which is separated from it. Also items d, e, and f in her list are in continental manuscripts joined together under some single caption such as *Third Book of the Testament, Practica of the Testament,* or *Practica de furnis.* Really only the initial chapter deals with furnaces, but this last appellation will be employed here as the least confusing of the three. In one manuscript of the fifteenth century[79] this *Practica de furnis* immediately follows the *Theorica* and precedes items a and b in Mrs. Waley Singer's list. In another[80] the *Theorica* is followed by what seems the *Liber Lucis* of John of Rupescissa, incorrectly ascribed here to Raymond, and by a *Practica nostri apparatus,* after which follows the *Practica de furnis,* while Mrs. Waley Singer's a, b, and c do not appear at all. In a third manuscript[81] the order—*Theorica, Practica, Mercuries, Practica de furnis*—is the same as hers, but then follow a *Liber brancharum testamenti, Cantilena,* and *Apparatus super testamentum,* the last named being identical with the *Practica nostri apparatus* of the other manuscript. The expres-

[79] FN Palat. 792.
[80] Vienna 5487.
[81] FN II. iii. 27.

sion, *Practica brancharum,* is employed in the *Anima artis* for a method of obtaining the stone, if not as a title.[82] Mrs. Waley Singer mentions the *Cantilena* as a common appendage to the *Testament,* but *Liber brancharum* and *Apparatus* seem not to occur in British manuscripts. Thus the continental manuscripts suggest new items for the list as well as variations in the order of arrangement or principle of division. This is not all. What we have designated as the *Practica de furnis* is sometimes found in the manuscripts as the concluding part of the *Book of Mercuries*. Indeed, it is hard to understand why Mrs. Waley Singer regarded items b, c, d, e in her list as distinct works, when in the sole manuscript which she gives for the *Book of Mercuries*[83] they are numbered consecutively as a single treatise in forty-nine chapters. Likewise in a Wolfenbüttel manuscript and a Vatican manuscript all this material is combined in a single *Book of Mercuries* but of fifty-two chapters, what is sometimes called the *Practica de furnis* beginning with chapter twenty-seven instead of twenty-three.[84] A better way of indicating the component parts of the *Testament* would therefore be as follows:

a. Theorica
b. Practica
c. Book of Mercuries, from which is sometimes separated
d. Practica de furnis.

to which are sometimes appended:

e. Liber Brancharum
f. Cantilena
g. Apparatus

In the fifteenth century manuscript where the works occur in just this order, at the close of the *Cantilena* we are told that this is the end of three essential works of the great *Testament* of Raymond Lull edited for the famous king of England, Ed-

[82] BN 14007, fol. 76v.
[83] BM Sloane 419.
[84] Wolfenbüttel 3076, 15th century, fols. 82v-124r, "Sequitur liber compositionis mercuriorum et Elixir de ipsis mercuriis"; Vatic. 5846, 1496 A.D., fols. 91v-120r, "Sequitur liber compositionis elixiris de ipsis mercuriis."

ward, namely, prudence, charity, and patience, that is, the major and minor form of the second part with the book of mercuries and the occult practice of the third part of mystic theory. This statement may not seem very illuminating, but in the alchemical bibliography of the Barberini manuscript is listed a "Practice of the Theory of the Testament which is the third part of the Testament and is called Patience." The incipit which is given for this third part is that of the *Practica de furnis*.[85] We may therefore assume that the *Book of Mercuries* was the second essential work and known as Charity, while "the major and minor form of the second part" or Prudence probably has reference to the *Practica* which immediately follows the *Theorica.*

In addition to the *Practica de furnis* and the *Practica* which usually precedes the *Book of Mercuries,* we hear in bibliographies of the fifteenth and sixteenth centuries of a *Practica sermocinalis* with a different incipit,[86] and some experiments seem to be taken from it in a sixteenth century manuscript.[87]

As has been said, even the first theoretical section of the *Testament* speaks of the author's other alchemical books which many read and cannot understand[88] and refers to what he has said in "the compendious art of our mastery."[89] This phrase corresponds to no known title in the Lullian alchemical collection, but he also alludes to what he proposes to say "in the second part of this book" and to "our *Practica.*"[90] In the closing chapter of the *Theorica* he cites the *De intentione alchimistarum*.[91] In an earlier chapter he cites the *Tractatus questionari-*

[85] Vatic. Barb. 273, fol. 212v: "Practica theorice Testamenti que tertia pars Testamenti est et appellatur Patientia. Fili ad componendum dictam medicinam. . . ."
[86] FL Ashburnham 190, 15th century, fol. 67r; Vatic. Barb. 273, fol. 212r, "Proprietatum liber et practica sermocinalis operis minoris theorice," opening, "Ars fundamentalis. . . ."
[87] FN II. iii. 28, 16th century, fols. 30r-33r, "Incipit liber experimentorum de praxi sermocinalis."
[88] *Test.,* cap. 39: Manget, I, 732, col. 1. Here and elsewhere in the notes *Test.* should be understood to refer to the *Theorica* or first part of the *Testament.*
[89] *Test.,* cap. 67: Manget, I, 749.
[90] *Test.,* caps. 71 and 54: Manget, I, 751 and 741.
[91] *Test.,* cap. 96: Manget, I, 762, col. 2.

us[92] which is usually found with or as part of the *De secretis naturae* or *Tertia distinctio*. The chief personal passage in the *Testament* is when the author professes to have congealed vulgar mercury two leagues from Naples in the presence of a royal physician, a Hospitaler, and Bernard de la Bret[93]—a statement which would ring truer from the lips of Arnald of Villanova. But such allusions and citations serve rather to mystify than to enlighten us as to the order in which the works of the Lullian alchemical collection were composed or the date and identity of the author of the theoretical part of the *Testament*.

The *Testament*—more especially its theoretical portion—and the *Codicil*, as being perhaps the chief and best known works in the alchemical collection ascribed to Raymond Lull, would seem the place to look for the characteristic and dominant ideas of that body of hermetic literature. There is a close resemblance between the contents and views of the two treatises, so that there seems to be no doubt that they are by the same author or school. The *Codicil* in fact does little more than reiterate what had already been said in the *Theorica* of the *Testament*, but is less mystical and more outspoken.

The *Testament* wears the garb and mien of scholasticism, as we are warned will be the case by its opening words, "Entia realia stantia in suis primordialibus et succedentibus principiis dant notitiam et causam cognoscendi naturam corporum et mediorum ac extremitatum. . . ." As the pleonastic rhythm of this sentence further suggests, the style is often rhetorical as well as scholastic in its terminology. The opening and closing words of each chapter have a measured ring, but this is true of the printed versions rather than the manuscripts. Some humanistic lover of the classics altered the wording and order of these endings from the manuscripts so that the verb would come last or the text otherwise conform to classical usage. He similarly altered all the opening words and, I presume, the entire text, though I have not followed through the comparison in detail. Sometimes his alterations seem motivated solely by

[92] *Test.*, cap. 64: Manget, I, 747.

[93] *Test.*, cap. 87: Manget, I, 758.

love of change and the conviction that no medieval manuscript could possibly be in good Latin. Thus if the manuscript says *postmodum*, the editor promptly alters this barbarism to *postea*, but if the manuscript says *postea*, he changes that too to some other form of expression. Much use is made of the doctrine of forms, of informative virtue[94] and *natura naturata*, of passing from potentiality to actuality[95] (*de potentia in actum*), of individuals in universality, *entia realia*, and other tags and phrases from Aristotle and his commentators. The author is also given to brief *obiter dicta* such as that reduction to fine particles leads to a simpler constitution of the matter involved, that without such reduction to simplicity there would not be potency,[96] that nothing corrupts another unless it be of contrary quality or of the same genus,[97] that elements in their simple state are beyond corruption and generation,[98] and that every metal in a state of solution requires a porous haven.[99] He further inclines to group things by threes. Thus there are three principles of all things: God, wisdom, and *hyle*.[100] There are three spirits: Recsage, Agazoph, and Ubidrugal.[101] There are three requirements for the artist: subtle natural genius, manual skill, and free will—which last further requires the triad of wisdom, wealth, and books.[102] Temperate, intemperate, and neutral form another important category.[103] Or we are told that there are three earths, three waters, three ferments, three gums, three saltinesses, and three things that congeal quicksilver.[104]

Much is made of nature and what is against nature,[105] as in the distinction between natural and unnatural heat. Marvels are accomplished not by magic and incantation but naturally,

[94] *Test.*, cap. 44.

[95] *Test.*, cap. 43.

[96] *Test.*, caps. 45, 48: Manget, I, 735, col. 2; also 737, col. 2. The importance of rarefaction and subtlety of substance is repeatedly stressed in the *Testament* as in cap. 72, or *Codicil*, cap. 49.

[97] Manget, I, 740, col. 1: cap. 54.

[98] *Test.*, cap. 70, Manget, I, 751, col. 1.

[99] *Ibid.*, cap. 66, Manget, I, 748, col. 1.

[100] Zetzner, IV (1659), 8: cap. 2.

[101] *Ibid.*, IV (1659), 21: cap. 11.

[102] Manget, I, 727, col. 2: cap. 31.

[103] Manget, I, 708, col. 2: cap. 1.

[104] *Ibid.*, I, 745, col. 1: cap. 62. *Codicil*, cap. 50: Manget, I, 895, col. 2. See also *Codicil*, cap. 3: Manget, I, 881, col. 1, "De forma tripartita."

[105] *Test.*, cap. 33. *Codicil*, caps. 5, 8, 10, 55.

and God accomplished what we call miracles through nature.[106] Such stock alchemical categories and antitheses as masculine and feminine, intrinsic and extrinsic, radical humidity, spirit and body, are repeated. Such then current medical conceptions as those of *complexio* and temperament are also utilized. We are told of a temperament which is neither hot nor cold, wet or dry, and yet is all of these, and that he who attains it will be worthy to be placed at the table of the twelve peers.[107] More distinctly characteristic of fourteenth century thought are the repeated allusions to proportion,[108] to means and extremes,[109] the assertion that all things in nature are made in a moment and corrupted in a moment,[110] the theory of a circulation or gyration of the elements to produce the stone and effect transmutation,[111] which reminds us of the similar doctrine of Perscrutator, and the chapter on the latitude of *complexio* with its mentions of "opposite differential qualities" and "particular ultimate complexions" which constitute the limits of the latitude of a temperament.[112]

This theory of circulation is set forth more than once in both *Testament* and *Codicil*. Thus in the former's seventy-ninth chapter we are told how the elements are subtilized or made gross by the circular wheel or golden chain of the philosophers. In the seventy-first chapter of the latter, it is stated that the whole secret and mode of operation consists in rotation of the elements, but unless you first perfectly comprehend the circle of nature you cannot understand their circulation. When the dry elements are rotated to humidity by many circulations of all the humidity, then first the elements are separated. Afterwards by other circulations which are made by the method of reduction the humid elements are rotated to dry. And the more these two processes are repeated, the more they are purified

[106] *Test.*, caps. 71, 75: Manget, I, 751, col. 2, 753, col. 2.
[107] Manget, I, 752, col. 1: *Test.*, cap. 72.
[108] Manget, I, 734, col. 2: *Test.*, cap. 44.
[109] See *Test.*, caps. 1, 2, 4, 5, 13, 53, 55, 56, 57, 58, 96, etc. *Codicil*, cap. 9.
[110] *Test.*, cap. 54: Manget, I, 740, col. 2.
[111] *Test.*, caps. 2, 74: Manget, I, 752, col. 2. *Codicil*, cap. 63: Manget, I, 908, col. 1. *Test.*, cap. 79: Manget, I, 755, col. 1. *Codicil*, cap. 71: Manget, I, 910, col. 1.
[112] *Test.*, cap. 95.

from earth, or the stone from impure earthy sulphur extraneous to it. The earth that we tread is not the pure element which is found at the earth's center.[113] It is also asserted that cold is the cause of ponticity, heat of bitterness and acidity.[114] From mixture in putrefaction results a certain force which is called the fifth spirit with its sixth operative virtue which connects the elements and introduces in them the desired effect.[115]

The pseudo-Raymond Lull conforms to the usual fourteenth century practice of refining the traditional hypothesis of the formation of the precious metals in nature and art from quicksilver and sulphur. As usual it is explained that vulgar mercury and common sulphur will not do. The former is too full of accidents,[116] while combustible sulphur "is extraneous to quicksilver." The sulphur needed in alchemy is found nowhere on earth and must be compounded by art.[117] No body existing in a natural state can congeal mercury, and the pure alchemical mercury and sulphur which are required are obtained by reducing gold and silver to these constituents.[118] A pure fixed white sulphur which will endure fire[119] and itself contains natural fire[120] is essential in the art. The whole mastery in total sum is nothing more than the multiplication of tincture effected in quicksilver by sulphur,[121] which congeals the radical humor of mercury and turns it into perfect metal.[122] But for our author sulphur is natural heat[123] and quicksilver is the material substance and radical humidity of all liquefiable bodies.[124] Once we are told that in gold and silver the quicksilver contains in itself its own sulphur,[125] and again that mercury is the mediator of gold and silver,[126] and that we should not operate except with mercury and silver or mercury and gold,[127] while a third

[113] *Test.*, cap. 51: Manget, I, 738-739.
[114] *Test.*, cap. 54: Manget, I, 740, col. 2.
[115] *Codicil*, cap. 33: Manget, I, 890, col. 2.
[116] *Test.*, caps. 44, 67: Manget, I, 735, col. 1; 749.
[117] *Test.*, cap. 18: Manget, I, 719, col. 2.
[118] *Ibid.*, cap. 19: Manget, I, 720, col. 1. See also *Codicil*, cap. 9: Manget, I, 884, col. 1.
[119] *Codicil*, cap. 54: Manget, I, 905, col. 1.
[120] *Codicil*, cap. 55: Manget, I, 906, col. 1.
[121] *Test.*, cap. 64: Manget, I, 746, col. 2.
[122] *Test.*, cap. 55: Manget, I, 741, cols. 1-2.
[123] *Ibid.*, cap. 64.
[124] *Ibid.*, cap. 57: Manget, I, 742, col. 2. See also cap. 65: Manget, I, 747, col. 1.
[125] *Test.*, cap. 5: Zetzner, IV (1659), 14.
[126] *Test.*, cap. 42: Manget, I, 733.
[127] *Ibid.*, cap. 62: Manget, I, 745, col. 2.

passage repeats that quicksilver by nature contains its own sulphur by whose vapor it congeals itself into the philosophers' stone. But it is promptly added that this stone is called sulphur.[128] That the quicksilver is to be converted into the essence of pure sulphur[129] or, by aid of gold, purely congealed into fine sulphur[130] is repeated elsewhere. This being the case, a passage which affirms that the more metals have of quicksilver in their constitution, the more perfect and precious they are, while the more sulphur they contain, the more they tend to corruption, must be speaking of vulgar sulphur.[131] But in the *Codicil* our author recalls having said in the *Testament* that no quicksilver is more promptly converted into the substance of sulphur than that in which the qualities of sulphur have been sufficiently introduced by dissolution, nor does any sulphur more promptly congeal quicksilver than that in the substance of whose nature quicksilver itself exists, so converted by the genius of art.[132] Thus we have both mercurized sulphur and sulphurized quicksilver. Indeed, it seems probable that our author employs the terms, sulphur and quicksilver, in several varying senses. Once, however, he condescends to treat three pounds of pure silver in very thin leaves with vulgar mercury, distilled vinegar, and common salt.[133]

Astrological analogy is occasionally employed in the *Testament*. Sun and moon—i.e. gold and silver—suffer eclipse and are in the head and tail of the dragon,[134] or sun and earth suffer a complete lunar eclipse, although the astrologers say that this is contrary to nature.[135] Or the author indulges more directly in astrological theory, speaking of macrocosm and microcosm,[136] of the impressions of forms from the starry heaven and its figurations,[137] of the importance of celestial virtue in transmutation,[138] and how the flood was caused by God's subtracting the virtue of the stars.[139]

[128] *Ibid.*, cap. 12: Manget, I, 716, col. 2.
[129] *Ibid.*, cap. 16: Zetzner, IV (1659), 27.
[130] *Ibid.*, cap. 43: Manget, I, 734, col. 2.
[131] *Codicil*, cap. 9: Manget, I, 884, col. 1.
[132] *Codicil*, cap. 32: Manget, I, 890, col. 1.
[133] *Codicil*, cap. 55: Manget, I, 906-907.
[134] *Test.*, cap. 44: Manget, I, 735, col. 1.
[135] *Test.*, cap. 42: Manget, I, 733, col. 2.
[136] *Test.*, cap. 51.
[137] *Test.*, cap. 53: Manget, I, 739.
[138] *Test.*, cap. 83: Manget, I, 757, col. 1.
[139] *Test.*, cap. 75.

A perversion of the work of John of Rupescissa on the fifth essence was often represented as the first two books of a work of that title by Raymond Lull. The Lullian work bears the alternative title, *De secretis naturae,* and this is further applied to a third book or distinction, *Tertia distinctio*. In other treatises of the Lullian collection occur citations from or allusions to his work on the fifth essence which cannot be referred to the *Tertia distinctio* merely, so that this perversion of Rupescissa's work appears to have been rather regularly regarded as a part of the Lullian corpus in general and of the *De secretis naturae seu quinta essentia* in particular.

An attempt to make out four books by Lull on the fifth essence is preserved in the detailed table of contents in a manuscript of the fifteenth century.[140] First comes a meeting of Raymond with a monk and their introductory dialogue. Then follows "a division of the book into four distinctions." First, concerning the fifth essence and its extraction, which is in two parts of five and forty-six canons respectively and seems to correspond roughly to Rupescissa's first book, except for the first part and that two canons have been added dealing with the artificial production of gems. The high numbering is, however, more like that of the chapters in the later printed texts than the usual canons of Rupescissa's work as found in the manuscripts. The second book on application of the fifth essence to ills of the human body also seems to correspond to Rupescissa's second book but has only seventeen canons instead of his score of "Remedies." The third book on alteration of metals and composition of the philosophers' stone contains Lullian alphabets, figures, and trees, and appears to be Raymond's *Tertia distinctio* or *De secretis naturae*. Then as the fourth book we have the *Questionarium,* which often is included in the *Tertia distinctio* as its concluding part. Finally, the whole is concluded by the disputation concerning alchemy between Raymond and the monk. This is a clever and seemingly organic combination, the introductory dialogues with the monk having been put before Rupescissa's two books so as to seem to

[140] Vienna 5509, fols. 75r-78r (newer numbering, 79-82).

include them, and the *Questionarium* of the *Tertia distinctio* being separated to make a fourth book just before the concluding disputation with the monk.

Almost exactly the arrangement indicated by the aforesaid table of contents is found in a manuscript at Oxford which the catalogues date as of the fourteenth century,[141] although I should incline to call it early fifteenth century writing.[142] The main difference is that the questions are not set off as a fourth book. This is also true of a fifteenth century manuscript at Paris, which gives first the meeting with the monk, then the two books based upon Rupescissa, then the *Tertia distinctio,* and finally the disputation with the monk.[143] It appears that this arrangement in three rather than four books is the usual or normal one, for the introductory statement describes the work as divided into three books, of which the second deals with the application of the fifth essence to human bodies and the third—i.e., the *Tertia distinctio* or *De secretis naturae*—with the transmutation of metals.

The pseudo-Lullian version of the work of John of Rupescissa on the fifth essence was the first treatise of the Lullian alchemical collection to be printed, appearing at Venice in 1514 under the title, *De secretis naturae,* together with the *Consilia* of Gianmatteo Ferrari da Grado (Iohannes Matthaeus de Ferrariis de Gradibus),[144] and in 1518 separately at both Venice[145] and Augsburg.[146] The Augsburg edition bears the title, *Of the*

[141] BL Bodley 645: see DWS 1, 243 (No. 255).

[142] I have examined a rotograph copy of it but not the original.

[143] BN 7164, fols. 15r-102v.

[144] *Consiliorum consumatissimi artium et medicine doctoris domini Ioannis Matthei de Gradi Mediolanensis secundum viam Avicenne ordinatorum utile repertorium. Additis . . . Necnon sacri doctoris Raymundi Lulii de insula Maioricarum de secretis nature libris duobus nunc primum in lucem editis,* Venetiis, 1514. There is a copy at the Bodleian.

[145] HL 29, No. 282.

[146] "Excusum Auguste Vindelicorum Anno Sal. MDXVIII. Die vero prima Iulii." I used a copy of this edition which was bound up with a MS which contains some of the pseudo-Lullian alchemical treatises, Vienna 11342. On the title page, fol. a i, we read: "Sacrido ctoris (i.e. Sacri doctoris) Raymundi Lulii de secretis nature sive de quinta essentia Libellus." On fol. a ii, "De secretis nature libellus. Incipit liber prime distinctionis secretorum nature seu quinte essentie sacri doctoris magistri Raymundi Lulii de insula Maioricarum qui doctrinam eius extractionis et applicationis ad corpora humana ad opera terribilia totius artis medicine procuranda et etiam metallorum transmutationem referat qui est imago omnium librorum super his tractantium." These last words may be regarded as an effort to claim precedence over the genuine Rupescissa treatise.

[147] *Idem,* "Contristatus erat Raymundus et non modica desolatione repletus . . ." DWS No. 255, says that this edition is "the only one we have seen containing the Prologue of Monaldus," i.e. the dialogue with the monk.

[148] This prologue has the same incipit as in the MSS, fol. a iii, "Deus gloriose cum tue sublimis bonitatis ac infinite . . ."

[149] Its "Pars secunda" begins at fol. a (vi), verso.

[150] DWS I, 244-246, lists six. Others are noted in Appendix 39.

Secrets of Nature or Of the Fifth Essence. It opens with Raymond's meeting with the monk,[147] after which as usual it is stated that the work divides into four parts and into three distinctions or books.[148] But after the two parts of the first book[149] and the second book with its usual seventeen canons or remedies, the edition ends without the *Tertia distinctio.* Various other versions were printed during the sixteenth century.

We have now to face the problem whether the Lullian perversion of Rupescissa and the *Tertia distinctio* were originally two distinct works or whether they and the dialogues with the monk were fabricated together as a single work on the secrets of nature or fifth essence. The *Tertia distinctio* is found by itself in a number of manuscripts,[150] but such copies of it as I have seen seemed to presuppose the existence of two preceding books on themes like those of Rupescissa's. The dialogues with the monk also seem to refer to all three books. We therefore are forced to conclude that the *Tertia distinctio* is not an independent treatise but written to form a third part with the working over of the two books of Rupescissa. This is a conclusion of importance for dating the Lullian alchemical collection, since we see that this hybrid work on the secrets of nature or fifth essence would scarcely have been composed until Rupescissa's books had had time to become well known and a temptation to forgers. Probably this would be after his death. Hence our inclination is increased to date the origins of the Lullian alchemical collection late in the fourteenth century.

Not only Rupescissa's work on the fifth essence but also the

Book of Light ascribed to him was claimed as a member of the Lullian collection, being found in one manuscript as the *Eight Operations* of Lull and in another as "A Shortening of the Book of Light of Raymond compiled by John of Rupescissa." In both cases it was shorn of its introduction. But to return to a survey of the component parts of the *Secrets of Nature*.

The dialogues with the monk ring most nearly true in style to that of some of Lull's works of undisputed authenticity, possessing the same naive and realistic charm as other dialogues in which he represents himself as participating.

"Very sad was Raymond and filled with not a little desolation because he had labored so long to spread his science through the world," and had been ridiculed by those who should have honored him, while the Roman church gave little heed to his demands. Wearied by these efforts on behalf of his Art and science, which brought him only a reputation as a fantastic fool (*stultus et phantasticus*), he was grieving in a desert near a Benedictine monastery when he encountered a monk who endeavored to cheer him up. After some discussion of the theme of divine justice, the monk, perceiving that Raymond was a learned man, inquired his name which Raymond reluctantly told him. The monk was delighted to meet one who had done so much by his Art for the conversion of infidels and the knowledge of many secrets of nature attainable through medicine and philosophy, and asked Raymond for "a most secret compendium" on remedies for infirmities and the question whether alchemy was true or not. Raymond replied that he had worked for twenty-seven years unceasingly, "but I find so few servants of Christ that now my soul is nauseated from such labor." But the monk continued to plead with the result that Raymond was received into the monastery and there produced a book which not only instructs how to cure human bodies miraculously, but also to convert imperfect metals into pure silver and gold. These allusions of the monk to remedies for infirmities as well as to transmutation and alchemy certainly suggest that the two books of Rupescissa, as perverted and Lullified, were already combined with a third book

on transmutation as a pseudo-Lullian work on the secrets of nature or fifth essence.

The pseudo-Lullian version of Rupescissa's two books on the fifth essence is usually markedly[151] different from the original. A first part is inserted in the first book which corresponds to nothing in the original work of Rupescissa but is distinctly pseudo-Lullian in thought and cites various other treatises of that collection. Then as a second part of the first book follow the Canons of Rupescissa, subdivided somewhat differently from his arrangement, shorn both of most of the picturesque diction and solid chemistry of the original, and with two or three additional canons on transmutation which are in direct contradiction to the refusal of Rupescissa to go into that subject. The second book then commonly has seventeen canons ending with surgical remedies instead of the twenty-one of Rupescissa which close with remedies for spasm.[152]

The *Tertia distinctio,* which divides into a brief Theory and longer Practice, is especially concerned with alphabets, philosophical trees, and circular and quadrangular figures, including an elaborate circular figure of the rational soul. The letters of the alphabet are given double or alternative significations as follows:

A	Form	Chaos
B	Matter	Matter
C	Bodies	Form
D	Menstruum	Menstruum
E	Calcination	Elements
F	Dissolution	Potency and Alteration
G	Evacuation	Mixture
H	Multiplication	Dissolution
I	Spirit (Gas)	Generation
K	Alembic	Colors

[151] I did not examine Vatican 5847, fols. 1r-29v, except hurriedly, but my impression was that it ascribed to Lull something more closely resembling Rupescissa's probable original. But in such earlier MSS as Bodley 645 and BN 7164 we find the Lullified version described in the text above.

[152] Vatic. 5487 has twenty-one chapters.

L	Quicksilver	Digestion
M	Natural sulphur	Perfect being
N	Tincture	Fermentation
O	Oil	Separation
P	Inceration	Operation
Q	The stone	Venenum transformans
R	Sublimation	Fire
S	Saturn (Lead)	Air
T	Jupiter (Tin)	Water
V	Mars (Iron)	Earth
X	Sun (Gold)	
Z	Venus (Copper)	
Y	Moon (Silver)	
YY	Elements[153]	

These letters are combined in pairs and other groupings which in the chapter or paragraph under the caption, "Of the Doctrine of Tables," are placed in various compartments. The third and last part of the *Tertia distinctio* is a series of questions to be answered by these Lullian or pseudo-Lullian methods. This section, as we have seen, is sometimes cited or found as a separate treatise under the title, *Questionarium,*[154] or *Questiones.*

In a manuscript collection of Lull's supposed alchemical compositions made in the last years of the fifteenth century[155] a work on the fifth essence in four books is again assigned to him, but while the first two correspond to Rupescissa's and the last is the *Questionarium,* the third is called *De cura individuorum.* It is, however, very similar to the *Tertia distinctio,* dividing like it into theory and practice, censuring Ortholanus, Archelaus, Alexander, Geber, Avicenna, and Albertus, employing alphabets and tables and figures. Its theoretical portion first treats of seventeen principles: namely, chaos, form, matter, the sky, the elements, mixing, dissolution, alteration, digestion, generation,

[153] These alphabets differ somewhat in different MSS. I here follow Milan, Ambros. D. Inf. 512, fol. 1v. In BL Bodley 645, fol. 46r, in the first alphabet Q is Sublimation, and R the stone, while the second alphabet stops at R.

[154] It is so listed in BM Sloane 75, fol. 185v, in the bibliography of Vatic. Barberini 273, fol. 211r, and in the table of contents in Vienna 5509, and is so cited in FN II. iii. 28.

[155] Vatic. 5846.

colors, separation, potency, operation, perfect being, fermentation, and perfect poison. Then eighteen more are set forth: form, matter, body, calcination, *lunaria,* dissolution, evacuation, mixing, spirit, quicksilver, sulphur of nature, tincture, sky (*celum* for *oleum*?), inceration, sublimation, the stone, the elements, and the vessel. In the manuscript copies of the *Tertia distinctio* which I have seen the second list was considered first, and the order and names in both cases were slightly different. But the *De cura individuorum* may safely be classed as a version or perversion of the *Tertia distinctio.*

Finally we come to the epilogue or disputation with the monk which follows the *Tertia distinctio* and its *Questionarium.* "And when Raymond composed the book concerning which he had been asked by the monk,"[156] he showed it to the monk, and the latter was amazed to find that Raymond favored alchemy and supported an art which had deceived so many persons and given rise to so many evils. Raymond replied that the reason for this was that those alchemists did not know natural principles or how to apply them: if they had, their efforts would have succeeded. The monk then asserted that alchemy was contrary to the Lullian art and to what Raymond had set forth in his *Liber entis realis et rationis, Ars magna,* and *Arbor scientie.* "And well thou knowest, Raymond, that he who goes contrary to his art ought not to be heard nor his art canonized." Raymond denied that his art contradicted the principles of alchemy and contended that one could adopt both without inconsistency.

The monk proposed to dispute the matter with Raymond with the understanding that the monk be allowed to choose the premises or *principia* on which the disputation was to be based. He then argued that if alchemy was so,[157] the nature of the world would have no end, and the substance of the universe would have no quiet, since transmutation would go on unceasingly. Also there would be contrariety instead of harmony between nature and its parts (*sua concreta*). Everything would hate its

[156] "Cumque Raymundus librum supra quod rogatus fuit a monacho compo- suit. . . ."

[157] ". . . si alchimia est ens."

own being and seek the privation thereof. "Therefore alchemy is not so, and its reasoning is fantastic and impossible."

Said Raymond, "Your arguments do nothing against me." Transmutation, like generation and corruption, shows that the world is not eternal. The nature of the transmutable metal is more at rest in the nature of that into which it is converted than it was in its own nature, for the nobler nature has the greater appetite to which the lesser submits. Raymond admits that nature and its essential parts cannot be divided, but this does not hold true of second matter (*secunda materia*), as the corruption of individuals of natural species shows. And everything would not hate its own being, since with change of form would come a new being.

The monk then returned to the attack contending that no transmutation was possible except by a vegetative medium. Otherwise Raymond's definition of *vegetativa* is false, and individuals would exist outside species. The monk added that Raymond knows that the vegetative philosophers' stone is invisible and impalpable and cannot be made artificially by the process set forth in his *Tertia distinctio* which he has made for the monk, "and the many other volumes which I have heard say that you have composed on this art." Here the hand of a literary forger first betrays itself in the *Disputatio,* for this allusion to many other books by Raymond on alchemy seems inconsistent with the monk's having asked his opinion about it at the start and later having expressed surprise that he should favor it. Raymond agrees that metals cannot be converted except by the vegetative medium, and that the philosophers' stone must necessarily be vegetative, but he holds that this is not impossible to produce artificially. The elementative and vegetative are one and indivisible, and the artist does not have to introduce the vegetative into a stone that exists denuded of the elementative. Which possibly means that in reducing the metals to the first elements one is preserving the vegetative medium. In this connection Raymond has referred to some of the figures of the Lullian art such as the red quadrangle and the philosophical tree.

Raymond concludes by commending his book to Christ's keeping, and we are usually told that he finished it at Paris in 1319 at the monastery of St. Benedict the Carthusian outside the city.

From the citations of a *Lapidarius* by other works of the Lullian alchemical collection we might infer that it was one of the original group or nucleus. But the version which seems most common in the manuscripts of the fifteenth century does not purport to emanate directly from the mouth of Lull but of someone who speaks of himself as the translator from Catalan into Latin. In a manuscript at Berne, however, Raymond is represented as speaking in the first person and the translator is not mentioned. This is also the case in the printed text.[158] The work appears to have consisted of a brief theoretical part in which certain principles (*principia*) were laid down, such as quicksilver, subtle waters, and the influence of the planets and fixed stars, and of a longer *Practica* or second part on the preparation of certain mineral waters to be used in forming the gems and then the manufacture of this or that precious stone in particular. Those versions which pretend to be by the translator into Latin commonly omit most of the theoretical introduction. But even the *Practica* contains a discussion why the virtue of the basilisk does not liquefy gold and other metals.[159] It is rather strange that the *Anima artis transmutationis,* although professedly merely a compendium from earlier Lullian works such as the *Testament, Codicil,* and *Lapidary,* gives instructions for the artificial formation of more precious stones than does the *Lapidary* as we have it.[160] Indeed, in one of our fullest manuscripts of it it is

[158] *Artis auriferae quam chemiam vocant volumen tertium,* Basileae, typis Conradi Waldkirchii, 1610, pp. 98-120: "Deus in veritate tua incipio . . . / . . . Explicit practica de lapidibus pretiosis secundum Raymundum Lullium scripta die 8 mensis Octobr. per Ioan. Miletum pharmacopolam Claudianum 1553."

This printed version is not, however, divided into two parts of theory and practice like MSS Berne A 78 and Wolfenbüttel 3076, but is in thirty-two successive chapters.

[159] Berne A 78, fol. 7v; FL Ashburnham 190, fol. 59r.

[160] *Anima artis* treats of the carbuncle, adamant, ruby, sapphire, garnet, turquoise, emerald, heliotrope, *canafeus* or *monascus,* topaz, chalcedon, beryl, and pearls. The *Lapidary* discusses only the formation of the emerald, carbuncle, diamond, *volatur* (?), garnet, ruby, beryl, and pearls.

described as abbreviated.[161] The artificial composition of gems was also treated in one of the last canons of the Lullified version of Rupescissa's *Fifth Essence,* while the formation of pearls was again discussed in the *Book of Mercuries.*

Of other works of the Lullian alchemical collection the *Lapidary* cites the *Testament,* its *Practica,* and the *Book of Mercuries,* also several times the *Apertorium* which is once also called *Experimentator,* and the *Magic Art* "according to the course of nature which we gave to good king Edward." In discussing the basilisk the author affirms that he has treated of this matter more fully in his work on sensible causes, a title which it is difficult to identify with any work either of the genuine or the alchemical Lull. The citations of the *Apertorium,* itself probably a late work, and the allusion to king Edward do not increase our confidence in the Latin text's being a translation from the Catalan or of early date. King Robert is also mentioned in at least one manuscript.[162]

One of the ideas expressed in the works of the pseudo-Lullian alchemical collection is that the transmutation of metals is a sort of natural magic, or that the results achieved by alchemists in their operations seem marvelous to the point of magic to the uninitiated. We also encounter various citations of a Lullian alchemical treatise with the title, *Magic Art.* In the alchemical bibliography in the Barberini manuscript two such titles are listed. The former is called *Magical Theory or Major Magic, part one,* and opens: "Sunt multi errantes in mundo . . ." The second is called *Compendium of the Magic Art or Minor Magic or Small,* and begins: "Compendium artis magice secundum cursum nature . . ."[163]

Both these works are extant. The former is found in a manuscript of the fifteenth century at Paris with the title, *Magic of the Philosophers' Stone,* and was printed in *Verae alchemiae,* Basel, 1561,[164] with the quite different title, *Ars intellectiva,* but

[161] Wolfenbüttel 3076: see Appendix 39.
[162] FL Ashburnham 190, fol. 61v.
[163] Vatic. Barb. 273, fol. 213r.
[164] The text begins at II, 112. There was another edition at Cologne, 1567.

in both cases with the same incipit as already stated. The most striking feature of this work is a number of scrolls divided into compartments in which Lullian concepts, terminology, and letters of the alphabet are combined with the then popular notions of degrees and latitude.[165] These are imperfectly rendered in the printed edition.

The other work has been designated by various titles, but the same text seems to underlie them all. What was printed as the *Compendium of the art of alchemy* is really identical with the *Compendium of the art of magic.* So is a *Magia naturalis.* The title, *Compendium of the art of magic,* might suggest that the work was an abbreviation of a longer work called *Ars magica* or *Magica,* but there appears to be no such text, and in the manuscripts these titles are given to the work in question. To avoid confusion between two *Magics* and for purposes of brevity and convenience, we shall refer to the former treatise as *Ars intellectiva* and to the present one as *Ars magica.* The *Ars magica* is a short alchemical tract in twenty-four or twenty-five chapters, according as the brief introduction is called a preface or chapter one. And sometimes the last chapter is omitted. The brief introduction strikes a magical note by promising that without sin, enchantment, or disturbance of sense and intellect, one shall see spirits in the air in monstrous forms of men and animals moving to and fro like clouds. When the introduction is omitted, the character and identity of the treatise become obscured, as the following particular cases will illustrate. When the introduction is retained, the incipit of the *Ars magica* is, "Incipit compendium artis magice secundum cursum nature reformatum . . ." or similar words.[166]

The following more detailed illustration of the condition of our texts may be worth noting. In two manuscripts of the fifteenth century at Florence the identity of the *Magic Art* has

[165] BN 14008, fols. 22v, 23v, 24r, 24v, 25v, 26v, 33v.
[166] In the printed version of Manget, I, 875, col. 1, this is perverted to "Incipit compendium artis alchimiae et naturalis philosophiae. Scias, charissime fili, naturae cursum esse. . . ."

been considerably disguised and obscured. In one case it is headed, "The Practice of master Raymond of the Isle of Majorca concerning the composition of the philosophers' stone, also of precious stones through the principles of the vegetable and mineral stone."[167] Straightway, however, this statement is negatived or supplemented by another calling it the *Compendium of the Soul of Transmutation.* That the work is, however, neither one of the *Practica's* ascribed to Raymond nor the *Anima artis transmutationis* is made evident from an examination of its text, which begins with what forms the third chapter of Manget's printed text of the *Compendium artis magicae,* or *alchimiae.* The text roughly corresponds to the printed version from this point through the twenty-fourth chapter but does not correspond to the twenty-fifth or last chapter of Manget. In the other case[168] the treatise was originally entitled, *Magia sive magica Raymundi Lulii,* but someone crossed out both this title and the whole page of text following, and apparently wrote in the substitute title, *Practica Raymundi de vero lapide* at the top of the second page of text, which begins like the other manuscript with what is chapter three in the printed version. Both manuscripts have thus deprived the *Magic Art* not only of its title but of its incipit, giving us the impression that the latter is "Accipe (or, "Recipe") nigrum nigrius nigro . . ." The second manuscript also agrees roughly with Manget from this point until the last chapter. Another interesting point about this second Florentine manuscript is that, after the *Magic Art,* is given separately a short text opening, "Fili, due sunt aque extracte ab una parte nature . . .," which are the opening words of what is represented in some other fifteenth century manuscripts of the *Magic Art* as its first chapter, following its introduction, but which is printed in Manget as chapter two, and which also forms the incipit of a Lullian treatise on waters. This *De aquis* or *De duabus nobilissimis aquis* is a collection made by a student in arts from the *Testament,*

[167] FL Gaddi reliq. 174, fols. 15r-21r: see Appendix 39.

[168] FL Ashburnham 190, fols. 54r-57r: see Appendix 39.

Ars magica, Accurtatio, Anima artis, Fifth Essence, and *Lapidarius.*

Since the *De intentione alchimistarum* is cited by both *Testament* and *Codicil,* it might on this evidence alone seem to be the oldest work in the pseudo-Lullian alchemical collection. But what has been printed as the *De intentione alchimistarum*[169] and is so listed by the *Histoire littéraire*[170] itself cites both the *Testament* and *Codicil.*[171] Indeed, in doing so it refers to Lull in the third person. These citations, however, are put in parentheses in the printed edition and so perhaps represent notes of a later glossator. But the editor of 1561 was himself doubtful whether the work printed as *De intentione alchimistarum* was by Raymond and declares it a translation from French into Latin, whereas Lull never wrote in French. Furthermore he has confused the title with that of a totally different alchemical treatise, the *Totum continens,* and what he has printed is quite unlike what is found in the manuscripts under either title.

In two manuscripts dating about 1496 and 1515 respectively and both written at Rome is a *De intentione alchimistarum* which both ascribe to Lull and which appears to have been composed in Latin originally.[172] The late date of these manuscripts makes us

[169] In *Verae alchemiae artisque metallicae citra aenigmata doctrina certusque modus scriptis tum novis tum veteribus nunc primum et fideliter majori ex parte editis comprehensus,* folio, Basileae per Henricum Petri et Petrum Pernam, anno salutis humanae MDLXI, pp. 139-155. This alchemical collection which seems to be nowhere available in this country (at the last moment I learn that there is a copy of it in the Library of Congress) is catalogued in the British Museum under Gulielmus Gratarolus as editor and under Raymond Lull. Graesse, I, 61, incorrectly cites its title as *Alchimiae verae artisque mettallicae citra aenigmata doctrina.* I shall refer to it henceforth as *Verae alchemiae,* 1561. Our treatise is entitled: "Liber Raymundi, ut puto, de intentione alchimistarum et totum continens: ex Gallico in Latinum versus relictis aliquot verbis Gallicis . . ." and opens, "Posteaquam per valde longum tempus nostram vitam exercuimus querendo. . . ." Its final paragraph, "De furnis et vasis," ends, ". . . et committimus in presentem custodiam. Explicit totum Continens."

[170] HL 29, 278-279.

[171] *Verae alchemiae.* 1561, p. 148, "Raymundus in suo Codicillo seu Vade mecum per eum transmisso ad regem Angliae Edwardum, ut in suo prooemio dicit"; p. 153, "acetum testamenti Raymundi."

[172] With the incipit, "Non obstante quod hec ars sit pars philosophie naturalis. . . ." For the MSS see Appendix 39.

doubt if the work is one of the earliest in the Lullian alchemical collection, and it seems to cite the *Book of Mercuries*.[173] Moreover, unlike most works in the Lullian collection, it cites many other authors: Alexander Grecus peripateticus, Plato, Albert in the third book of *Minerals*,[174] Morigenes, Aristotle, Memphilus in the book on the properties of bodies, Rosarius, Democritus, Bonellus, Raynaldus (i.e., Arnald of Villanova), and *Liber utilitatis*.[175] Or Arnald's *Mirror of Medicine* is cited, while to Albert is attributed a *De regimine perfectionis* which is presumably spurious.[176]

In a third manuscript of the fifteenth century a work entitled *Donum dei* is called in the margin *De intentione alchimistarum* but seems a different text, in four brief books, from either of those previously mentioned. In yet a fourth manuscript of the sixteenth century a *Compendium* or *Lumen luminum* is further entitled *De intentione alchimistarum* but seems to offer yet a fourth text. Indeed, the manuscript in which it is found consists almost entirely of works added to the Lullian collection after 1500.[177] All this confusion makes it doubtful if any at all early alchemical text with the title, *De intentione alchimistarum,* is extant.

Some difficulty is raised by the title *Apertorium,* first as to which alchemical writing ascribed to Lull it properly belongs, second as to its relation to the Lullian collection. The word is apt to be confused with the *Repertorium,* but these are two distinct works, or to appear mixed in with other titles such as the *Anima artis transmutationis*,[178] or *Clavicula*. The *Apertorium* itself also in the manuscripts sometimes carries alternative titles

As has been noted in a previous chapter, the work with this incipit is sometimes ascribed to a brother Bernard or to Bernard of Treves.

[173] Vienna 11342, fol. 14r, "2° mercuriorum."

[174] *Ibid.*, fol. 11v.

[175] *Ibid.*, fols. 13r, 13v, 18v, 20r, 22r.

[176] Vatic. 5846, fols. 172v, 177r.

[177] For these two MSS see Appendix 39 under *Donum dei* and *De intentione alchimistarum.*

[178] In BN 14007, 15th century, paper, fols. 70r-82v, *Anima transmutatorie artis* is given the alternate title "sive Apertorium" at the beginning, while at the end we read, "Explicit Apertorium testamenti et codicilli et lapidarii R. Lulii."

such as "Apertorium abbreviatum, alias Experimentatorium Raymundi,"[179] which tend to confuse it with other works in the collection. We shall here, however, apply the title, *Apertorium,* to the treatise which was more than once printed under that caption[180] and which opens with the statement that the sages say or assert that there is only one stone composed of the four elements.[181] In the list of Lullian alchemical works in the Vatican Barberini manuscript two *Apertorium's* appear.[182] One is an "Experimentorum (?) seu Apertorium," with either the incipit which we have just described, "Sapientes dixerunt quod non est nisi . . .," or "Aqua vero nostra philosophica . . .," which are rather the opening words of the *Repertorium.* The other *Apertorium* has the incipit, "Fili, due sunt aque extracte . . .," which are rather the opening words of the *Magic Art* and of a treatise on waters. On the other hand, there appears to be no distinction between the *Apertorium* and *Apertorium abbreviatum* or even the *Apertorium animae et Clavis totius scientiae occultae in omni transmutatione metallorum,* which latter the *Histoire littéraire* listed as a separate work with a different incipit,[183] unless that it may be a late working over of the original *Apertorium.*

The *Apertorium,* as we have identified it, differs from most

[179] BM Sloane 1091, 15th century, fols. 108v-117v. DWS No. 258. In BU 142 (109), 16th century, fols. 90r-102r, the work is again entitled, "Appertorium abreviatum Raymundi Lullii," but the alternate title does not appear.

[180] In *Verae alchemiae artisque metallicae doctrina,* Basel, 1561, II, 104-112; also at Cologne, 1567; and Nürnberg, 1556, according to HL 29 (1885), 277, which is, however, mistaken in identifying Manget, I, 872-875, with the *Apertorium.* The text in Manget is the *Clavicula,* "quae et Apertorium dicitur," but I distinguish the two different texts by separating these titles. The *Clavicula* seems a much later work than the *Apertorium.* I have found it in no fifteenth century manuscripts or lists.

[181] The precise wording of this incipit varies in different versions. Thus in the printed editions we find, "Sapientes asserunt quod tantum sit unus" etc., or "Sapientes nostri asserunt. . . ." In Sloane 1091, 15th century, fol. 108v, "Sapientes dicunt quod non est nisi unus lapis tantummodo. . . ."

[182] Vatic. Barb. 273, fols. 212v and 214v.

[183] HL 29, 373: "In nomine patris et filii et spiritus sancti, o domine Jesu Christe, ego Raymundus, miser peccator . . / . . . Explicit Apertorium anime compositum in S. Catharina Londini ad Carolum filium Eduardi regis." No manuscript authority is given for the opening and ending by HL, but in FN II. iii. 28, 16th century, fols. 149r-157v, a like title is addressed to Charles.

works of the Lullian collection in that it repeatedly cites the philosopher or *philosophus,* and even Hermes and Morienus by name, but does not allude to another work of the Lullian collection until its closing sentence when it cites the *Testament.* The only other Lullian allusion in the work is to king Robert, in whose company our author states that he had observed the efforts of other alchemists. But this allusion would apply as well to Arnald of Villanova, although it suggests a passage in the *Testament.* The *Apertorium* is said to be cited in its turn in the *Testament* by a late fifteenth century copyist of the *Apertorium* who states that Raymond cites its third book in his last *Testament* and that therefore there should be more books of the *Apertorium* than the one extant. And in a manuscript at Bologna there is a *Practica* which is called the second part of the *Apertorium.*[184] The *Apertorium* repeats some of the ideas contained in the *Testament* and other works of the Lullian collection, such as the need of means between extremes and that the ignorant populace would take our mastery for a work of magic. But as it does nothing anyway but repeat trite alchemical ideas in a colorless manner, its relation to the rest of the Lullian alchemical collection does not seem very close. It is written in a different style and makes no attempt to simulate the methods of the Lullian art. However, it usually bears Raymond's name, and some treatise with that title, at least, is ascribed to him in all the fifteenth century lists of his works which I have seen. In a sixteenth century manuscript of a work ascribed to Lull on the generation of stones in the manner of his *Lapidarius* reference is made to "our *Experimentatorium* called *Apertorium* which book is the chief key to all our books which we have made in this art."[185] This is however, rather too flattering a description of the *Apertorium* as it has reached us.

Although the *Anima artis transmutatorie* or *transmutationis* and *Compendium animae transmutationis metallorum* are listed separately in the *Histoire littéraire*[186] as if different works with

[184] BU 169 (181), 9, fifteenth century according to Frati: "Incipit practica que dicitur secunda pars secunde partis apertorii."

[185] BN 7150, 16th century, fol. 14r.

[186] HL 29, 282-283, 372-373.

different incipits of which the former was composed at Montpellier in 1321 and the abridgement at the same place in 1333, they prove upon examination to be one and the same work.[187] One incipit is that of the dedication or prologue addressed to king Robert of Naples,[188] the other that of the text proper.[189] Moreover, the author states very clearly that this work is a compendium from his *Testament, Codicil, Vade mecum,* and *Lapidarius,* and that to this compendium he has given the title, *Anima transmutatorie artis metallorum.* Since the suggested dates for its composition conflict and are given in manuscripts which themselves date only from the fifteenth century, there is the less reason for accepting either as the year of authorship, while the address to king Robert may also be fictitious. The allusions in the work to king Edward of England do not increase our faith in its early date or dedication to Robert. Since the treatise does not assume to be other than a brief restatement of some of the theory and practice of the author's previous works, we need not go into its contents otherwise than to note that directions for the artificial composition of gems constitute its chief feature. It may, however, be of value in determining the order and relationship of the various texts and parts of the *Testament* ascribed to Raymond Lull. These according to its arrangement would seem to have been a *Theory, Practice, Practica brancharum,* and *Lapidary* or instructions for making artificial gems. *Testament* and *Codicil* are the writings most frequently cited in it, but *Vade mecum* and *Lapidarius* are also referred to, while in one passage allusion is made to the author's *De intentione alchimistarum, Third Book of the Fifth Essence, Experiments,* and *Magica.*[190] Whether all these titles may be regarded as earlier than the *Anima artis* or whether some of them were interpolated in its text later is a question.

An even briefer statement of the pseudo-Lullian alchemy than

[187] DWS No. 253.

[188] "Fulgeat regis diadema Roberti regum illustrissimi. . . ."

[189] "Iam sepe et sepius allocuti (elocuti) . . ."

[190] Of these titles the printed text (Zetzner, IV, 174), gives only *Magica* and *Third Book of the Fifth Essence,* while Vatic. 5847, 1500 A.D., fol. 85r, gives the other two as well.

the *Anima artis* was the *Epistola accurtationis* or *Accurtatio,* as we in turn shall abbreviate its title. It likewise professed to address king Robert of Naples. It is found in the manuscripts more frequently than any other work of the Lullian alchemical collection, but, as we have already suggested in describing its stock, late introduction, was almost certainly not one of the original group in that collection. It was, nevertheless, already widely circulated in the fifteenth century. The animal, vegetable, and mineral stones are discussed in response to the king's question which of them is more useful, quick, noble, and efficacious. The question of a short-cut in the procedure connected with each stone is then taken up.

The tract entitled, *Investigation of the Hidden Secret,* occurs in whole or part in a number of manuscripts, mostly of the fifteenth century. It is divided into three parts of which the first investigates alchemy itself, the second treats of some Lullian principles signified by letters of the alphabet, and the third descends to practice. This third part which often occurs alone begins by taking the urine of twelve virgin boys and produces an elixir one drop of which will turn a thousand parts of baser metal into pure gold. It also treats of the composition of precious stones from carbuncles to pearls. The proper incipit of the full text is, "Quia homo est magis nobile animal de mundo . . ." That of the third part is, "Ista est tertia pars . . ." The tract *On the Investigation of the Stone,* mentioned by the *Histoire littéraire,* appears to be a different work of which only one late manuscript is known.[191] The same is the case with an *Investigation of Secrets* in a sixteenth century manuscript at Florence.

A collection of alchemical *Aphorisms,* probably suggested by the medical work of that title by Hippocrates, is ascribed to Raymond Lull in several manuscripts of the fifteenth century.[192] The nature of these brief dicta is sufficiently illustrated by the first which also constitutes the incipit of the treatise, "The gold of the philosophers is a stone rare to touch"—a sentiment with

[191] CLM 10600: see HL 29, No. 278.

[192] DWS, No. 262, lists three in England at Cambridge, Oxford, and the British Museum. See Appendix 39 for others.

which opponents as well as adherents of alchemy might agree. In the manuscript which I examined these apothegms were grouped under four regimens.[193] These *Aphorisms* are presumably culled from various works of the Lullian alchemical collection, but it does not seem worth while to attempt to trace each to its source.

There are three works on the border-line between medicine and alchemy which the *Histoire littéraire* does not include among the alchemical treatises attributed to Lull but which may with some propriety be put with that collection since, like its components, they appear to be not by Lull but written after his death and since they to some extent envisage metallic remedies or elixirs of life. The one of them which there is the least reason for classing as alchemical is that on the conservation of human life which remains purely medical in character until the very close when it praises gold and *aqua permanens.* It appears in two lists of Lull's works in fifteenth century manuscripts, in the one case among some thirty-six titles almost all of which are alchemical, and is also included in an alchemical bibliography which is probably of the later sixteenth century. But it is not in Raymond's 1311 list of his own writings, and the only manuscripts of it that I have found date from 1516 and the seventeenth century.[194] It is, however, cited concerning potable gold by the *Epistola accurtationis*[195] of which there are numerous fifteenth century manuscripts. So far as I can see, there would have been no discredit to Raymond, had he actually written this treatise, and—aside from the problem whether that be creditable or no—it does not involve any belief in the transmutation of metals. But there is no strong evidence for regarding it as authentic, while it is cited by works of the Lullian alchemical collection as if it were one of their number. I therefore have included it here.

A second work of a medical character is the *Ars operativa*

[193] Vatic. 5847, fols. 109v-110v (old numbering 326v-327v), "Incipiunt Anphorismi Raymundi Lulli feliciter."

[194] These MSS (see Appendix 39) have already been mentioned by HL 29, 261 (No. 91), which also lists editions of 1516 at Rome and 1616 at Strasburg.

[195] Cassel Chem. Folio 13, 1478 A.D., fol. 105r: BN français 19960, fol. 4r.

which exists in manuscripts of the fifteenth century[196] and was printed at Lyons in 1523 and at Basel with the treatise of John of Rupescissa on the fifth essence.[197] It sometimes bears the alternative title, *Of waters and oils,* which characterizes its content fairly well. It is said to have been composed while Raymond was at Lérida and was therefore classed as spurious by the *Histoire littéraire* on the ground that Lull never was in Lérida. The work further professes to be in four sections, of which the first and fourth were not original with Raymond but derived from king Robert of Naples who had them in his turn from Arnald of Villanova. Just where a dividing line should be drawn between the second and third sections by Raymond and the first and fourth was not very clear in those versions which I have seen and which seem to consist of a number of waters, oils, and sperms. But the first section is probably that on *aqua vitae,* while the fourth section includes the other things after all waters have been treated.[198]

The *Great Medicine* or *Secret Medicines* attributed to Raymond Lull,[199] who is supposed to have addressed it to king Robert of Naples,[200] is a work of alchemical medicine somewhat akin to Rupescissa's two books on the fifth essence to which it might well serve as a complement. It deals with a most elaborate medicine which aims to preserve human life and youthfulness as long as possible and to cure any and all diseases. In disclosing

[196] See Appendix 39.

[197] Joannis de Rupescissa, *De consideratione quintae essentiae,* Basileae, 1561, pp. 175-208: I used a copy at the British Museum with the shelf mark 1033.f.32. HL 29, 260 (No. 89), alludes to editions of the *Ars operativa* at Basel in 1561 and 1571. For the 1523 edition see note 66.

[198] Thus in FL Ashburnham 1448, fol. 47r, "Et sic finitur tertia divisio aquarum," after which we read, "Candida sic fit . . ." etc.

[199] Incipit, "Proponimus namque tibi in presenti libello. . . ." HL 29, 260 (No. 88), listed it under spurious medical rather than alchemical works of Lull, although as proof of its spuriousness it adduced its citation of the alchemical *Liber quintae essentiae.* Besides the printed version in *Lulli Varia,* Cologne, 1572, pp. 403-458, and that of Basel, 1600, pp. 330-374, bound with the Cologne, 1567, edition of other Lullian alchemical tracts, and MSS BN 7150, fol. 25, and CLM 10599, mentioned by HL, I have found other MSS named in Appendix 39.

[200] This does not appear in HL or the editions of 1572 and 1600, but is found in the MSS.

this great secret the author first lists various minerals, animals, herbs, barks, gums, and the like from which the fifth essence should be extracted to compose this medicine. The long list, which varies somewhat in different manuscripts,[201] consists chiefly of ingredients from the vegetable kingdom, only a dozen mineral and eleven animal substances being specified. Second, he instructs how to extract the fifth essence from them. Third, the proportions are given in which they should be combined. Fourth and last, the virtues of this omnium gatherum and panacea are set forth, and its administration for various bodily complaints. *De magna medicina* is a title which fits the work much better than "In medicinis secretis libellus," or "De medicinis secretissimis" which is applied to it in both the printed editions.

A work which from its title would seem closely related to the foregoing is that "On the Degrees of the Great Medicine," in seventeen chapters. However, the text included under this title appears to be a general screed on the philosophers' stone, including many stock alchemical passages such as the comparison of the virtue of gold to that of the ruby, that on binding the wet-nurse's hands behind her back, and that beginning, "Hic ergo siste gradum . . ." found in the *Rosarius* opening "Desiderabile desiderium" of John Dastin, and occasionally quoting alchemical verses, but to have nothing to do either with degrees or the great medicine.

Different works on potable gold seem to have been attributed to Raymond Lull. The *Histoire littéraire*[202] notes a *Liber ad faciendum aurum potabile,* or *De compositione et virtutis auri,* in a manuscript at Paris, which opens, "Fili doctrinae, postquam ego Raymundus Lullus vobis declaravi in precedenti tractatu . . ." Undoubtedly the work is spurious, although it manifestly belongs to the Lullian alchemical corpus, since the author not only calls himself Raymond Lull but cites the ninth chapter of the *Testament* and "our book of the fifth essence in the chapter on the calcination of metals." Since, however, the only known

[201] Thus Vatic. Ottob. 1853 gives only ten minerals, omitting lapis lazuli and terra sigillata.

[202] HL 29, 374, No. 272.

manuscript of the tract is of the sixteenth century, it is doubtful if it formed a member of the Lullian alchemical collection before 1500. Giving it, however, the benefit of the doubt, we may note that it claims for potable gold the familiar alchemical property of curing infirmity of a month's duration in a day, and of a year or more in a month or less. Moreover, a quantity of this potable gold of the size of one grain of millet poured on the root of a plant produces leaves and flowers—a result which those ignorant of the art think a miracle and enchantment. The author presently turns to a series of waters made from such substances as honey and air or an old hen or capon but comes back at the close of the treatise to the theme of the multiplication of potable gold.

The other version, transcribed in a neat book-hand of the fifteenth century in a manuscript at Cambridge,[203] is described in a table of contents of the early sixteenth century which is pasted on the flyleaf as "Aurum potabile Raymundi." This ascription has been followed by Nasmith, James, and Mrs. Singer,[204] but the text itself is headed simply "Aurum potabile" and contains no mention of Raymond. The tract is found also in a Sloane manuscript[205] where it seems to be ascribed to Iohannes Tectinensis, and a treatise attributed to him precedes it in the Cambridge codex.[206] In the top margin of the latter manuscript a different hand has scrawled a note to the effect that fuller information concerning this potable gold can be had in John of Rupescissa's work on the fifth essence, in its fourth canon. It may also be noted that a considerable section[207] of our tract bears a certain resemblance to Arnald of Villanova's treatise on human blood. Both works make a good deal of consigning "to the well of penitence" anyone who reveals this secret to the foolish and unworthy. Both regard it as a celestial gift

[203] CU Corpus Christi College 99, 15th century, pp. 106-108, Aurum potabile, opening, "Respice aurum potabile quod est maximum secretum in medicinis naturalibus. . . ."

[204] DWS, vol. I, No. 265.

[205] BM Sloane 1091, fols. 51v-53; cited by DWS, *idem*.

[206] CU Corpus Christi 99, pp. 102-106, Tractatus Ioannis Tectivensis.

[207] Page 107 especially.

from God. Both deal with the extraction of the elements, although in the case of our present treatise it is not clear whether they are to be extracted from the potable gold with which we started.

While no mention of Raymond Lull occurs in the text, other authors or persons are mentioned in a way to suggest a date for its composition. A certain Hugh is cited as to the soft, flexible, and wax-like consistency to which potables should be reduced.[208] We are further told that John, cardinal of Toledo, "and all the cardinals" took this potable gold in their food "so long as they lived in the cardinalate and held it for the greatest and noblest secret that they knew or had."[209] The latest John who was cardinal of Toledo before 1500 died in 1275, and our treatise would therefore seem to have been composed not long after that date. It thus would fall within the lifetime either of Arnald or Raymond, but—as between the two—seems more likely to be the work of the professional physician who served several popes. The subject of potable gold is somewhat confused in our treatise with that of precious stones, which we are told may be rendered potable by a like process and which have marvelous effects against human sickness, "as is stated in the book concerning precious stones."[210] It is perhaps this allusion that has led to the treatise being attributed to Raymond Lull.

Our treatise claims to deal with a new discovery which the ancients, whether medical men or philosophers, did not have, "but we moderns have it and have learned it by experiments."[211] As is so often the case, this experimental note is accompanied by magical detail, for the treatise closes with an account of a common herb, found at all seasons and wherever it is sought, which

[208] CU Corpus Christi 99, p. 106, ". . . ita iurabat et affirmabat dominus Hugo et sermo fuit ut eos faceret potabiles molles et fluxibiles sicut cera." The passage immediately succeeds the opening words quoted above in note 203.

[209] *Idem*, "Et scias quod dominus Iohannes cardinalis de tholeto et omnes cardinales usi fuerunt in cibariis quamdiu vixerunt in cardinalatu et habuerunt pro maiori et nobiliori secreto quod scirent vel haberent."

[210] *Idem*, while a little earlier the author writes, "sicut vobis dicam de artificiali preparatione lapidum preciosorum."

[211] CU Corpus Christi 99, p. 107, "Sed nos moderni habemus et per experimenta cognovimus."

gives love and victory, and, if wrapped round the magnet and carried in a white cloth, makes its bearer honored by monarchs and magnates and procures his acquittal if accused of crimes. It routs evil men and spirits.[212]

In the midst of the *De cura individuorum* ascribed to Lull, or at least between its text and accompanying tables is inserted a brief recipe of a few lines with the caption, "Potable gold is made thus according to Raymond Lull."[213] This is briefer than the other two tracts on potable gold attributed to him which we have just described, and also has a different incipit.[214]

Although the *Experiments* are dated in the year 1330, and are cited in such works of the Lullian alchemical collection as the *De secretis naturae* and *Anima artis,* there seem to be no manuscript copies until the sixteenth century, and it may be doubted if these or the text as printed from 1572 on give the text cited by those earlier works. This doubt is strengthened by the uncertainty which prevails as to the opening words of the treatise. The incipit of the printed text and in one manuscript is, "Accipe tartarum utriusque vini. . . . " But according to the alchemical bibliography in the Barberini manuscript the incipit both of a *Book of Experiments* and of *Twenty-Four Experiments* was, "Deus cui (or, cuius) ab hominibus . . . ," while still other opening words are suggested by other manuscripts. Of the seventeenth experiment in the printed version[215] it is said that it is found also in the *Apertorium, Accurtatio,* and *Ultimum Testamentum.* This gives the impression that the *Experiments* are a selection made from the other alchemical works ascribed to Lull. Another indication of supposititious authorship is that the thirteenth experiment is said to have been revealed to Lull by Arnald of Villanova, and that Raymond performed it for the king of England who pretended that he was going to fight the Turk but instead fought the king of France and threw Raymond

[212] CU Corpus Christi 99, pp. 107-108. For a similar herb see the closing paragraph of our fourth chapter.

[213] Vatican 5847, fol. 55v, "Aurum potabile sic fit secundum Raymund Lul."

[214] *Idem,* "Aqua vite descendens ab aqua vite sic fit. . . ."

[215] I have used the text as printed by Manget, I, 826, col. 2-849, col. 1.

into prison, from which he finally escaped. In the thirty-fourth experiment the author also speaks of working for the king of Naples. The *Experiments* close with a warning against great lords and princes and an exhortation to union and piety addressed to the author's co-laborers in these experiments of alchemy. A cleverly realistic touch is given in his proposal that in return for having nourished them in his house he be permitted to retain the vessels and other paraphernalia of their art in addition to his share of "the medicine" and the results of the experiments. Before parting, all bind themselves by an oath of secrecy.

The treatise given in Manget's collection as *Vade mecum*[216] —but not the same as either the *Clavicula* or *Codicil*—seems a late member of the Lullian collection. The reader is urged not to be negligent in reading Raymond's other books of which, however, the *Theorica Testamenti* is the only one specifically cited. Otherwise the brief treatise is a series of trite, general reflections with a harangue against erring would-be alchemists. I know of no manuscript before the sixteenth century.[217] The work does not appear in the manuscript collection of Lullian alchemical treatises which Peter Boccatus of Tivoli made in 1496-1500, nor is its title in the subsequent bibliography of the Barberini manuscript. Its first recorded publication seems to have been the edition of Basel, 1572. An alternative title for it is *Liber artis compendiosae.*[218]

We have seen in an earlier chapter that the *Potestas divitiarum* is in part at least identical with a work of Ortolanus. The title, however, *Power of Riches,* was perhaps suggested by a passage in the *Testament* which states that the alchemist needs wisdom to detect fallacies, riches to have the power of operating, and books to enlarge the understanding.[219]

[216] Manget, I, 849-852. Incipit, "Tinctura ignis est melior omnibus tincturis. . . ."

[217] FN II. iii. 28, fols. 54r-63r.

[218] HL 29 (1885), 280.

[219] *Test.,* cap. 31; Manget, I, 727, col. 2; "Et hoc requirit sapientiam divitias et libros: sapientiam ad sciendum facere, divitias ad habendum postestatem faciendi, libros ad intellectum aperiundum diversum qui est in multis gentibus." A *Potestas divitiarum* is attributed to a Hugo Pisanus in BU 747 (1492), 15th century, fols. 76v-81r: "In compositione . . . / . . . et naturam posside."

Not to be included in the Lullian alchemical collection is a work *De mirabilibus rebus* which he is represented as having translated from Greek into Latin. In the fifteenth century Latin manuscript of the work which I have seen[220] an attempt had been made to give an alchemical air by drawings of apparatus in the margin and even by inserting a heading, "Raymond on Fixed Gold,"[221] in the midst of the text and adding this as the title of a second treatise on the title page.[222] For this there is no justification in the text which, whether a translation from the Greek or not, is a collection of notable things from classical times and places and is probably taken from some author like Pliny or Solinus. Among these wonders of art and nature such as a marvelous fountain in Tyana, a city of Cappadocia, or the fires of Etna, or art of Phidias, a few metals are included such as copper of India and tin of Crete. This is the nearest approach the work makes to being alchemical.

A good example of possible confusion between Raymond Lull and John of Rupescissa and of the blending of their influence on subsequent alchemical writings is seen in a brief treatise which seems to have no title and may be distinguished by its opening words, "Iste est modus de lapide minerali. . . . " It is a loosely put together collection of familiar alchemical *dicta* and more practical directions for the process of transmutation. It ends by praising Christ and the virgin Mary, also "our holy father, Raymundus Lully," and by expressing the hope that the greatest treasure of all worldly treasures may be lavished on evangelical men professing poverty. The last words suggest the

[220] Florence, Riccard. 932, 15th century, paper, 21 short lines to a page in a semi-humanistic hand, fols. 1r-51. "Tradustio de greco in latinum per clarissimum virum dominum Raymondum Lullium excellentissimum de mirabilibus rebus ad nobilem et doctum virum Hieronymum Lassagnatum. De fonte Asbameo mirabili adversus periuros. Apud Tuanam civitatem Cappadocie. . . ."

[221] *Ibid.*, fol. 41r, "Raimundus de auro fixo." The first 19 fols. of the MS had been full of such headings, after which none occurred until this, although spaces were sometimes left for them, of one of which advantage was here taken.

[222] On the second fly-leaf before fol. 1r is written in heavy letters, "Raimundus Lullius de mirabilibus rebus e Graeco in Latinum translatio." Below is added in less heavy script, "Et de auro fixo."

phraseology of John of Rupescissa. The writer seems to regard himself as of the school of Lull, but does not attempt to pass off his work as by Raymond. The date of composition is otherwise uncertain, but the handwriting of the only manuscript known to me is of the fifteenth century.[223] Another manuscript with a similar incipit, listed in the catalogues as of the fourteenth century, turns out to be a quite different and even briefer alchemical tract.[224]

How Raymond Lull appeared to readers at the close of our period may be illustrated from what purported at least to be a paraphrase of his works and teaching which was printed in 1523.[225] In the section devoted to Perspective[226] we are told not only that distorted figures are produced by crooked mirrors but also that by means of nigromancy appearances can be produced without reality by coercing demons by the virtue of words to receive the opposite influences which the heavenly bodies exert and to represent them to human senses.[227] The meaning is that when Aries and Jupiter are above our horizon the demons should avail themselves of conditions prevailing under Libra and Mars in the Antipodes. Thus a demon might take the shadow of a snake from the place where it lives in the Antipodes and represent it to us in a straw or thread or stick so that these would seem turned by magic into snakes. After this degeneration from optics to nigromancy Raymond or his abbreviator checks himself, stating that there are many other forbidden arts or "faculties" of which

[223] Oxford, Corpus Christi 136, fols. 1r-7v. DWS III, 1158, has corrected the fourteenth century dating suggested for it in DWS No. 263.

In Vatic. Palat. 1329, fol. 157r, occur the words, "Iste est modus de lapide minerali," which were possibly intended to form the opening of a treatise which was never inserted in the manuscript. As it is, they come at the close of a tract which is not that of which we have been speaking but which opens at fol. 155r, "Accipe in nomine domini de lapide minerali. . . ."

[224] BL Fairfax 22, fols. 26r-27r, opening, "Iste est modus absconditus a sapientibus . . ."; DWS No. 263.

[225] For the edition see note 66. Raymond is occasionally mentioned as another person than the author, as in the very opening words, fol. 1: "Quamquam ars generalis illuminati doctoris magistri Raymundi. . . ." See, too, fol. 137v, "tu tamen si vis ad veritatem de iudiciis te intromittere vide astrologiam illuminati doctoris nostri magistri Raymundi. . . ."

[226] "Secunda pars octavi libri: Perspectiva," fols. 145v-146v.

[227] *Ibid.*, fol. 146r-v.

he refuses to treat such as chiromancy, astragalomancy, cosmomancy, sternomancy, alectromancy, pyromancy, alphitomancy, aleuromancy, chritomancy, hydromancy, and geomancy. Later on, in the section devoted to natural questions, the alchemical *Testament* is unquestioningly cited as a work of Lull.[228] On the other hand, Lucius Bellantius, who in 1498 defended astrology against the attack of Pico della Mirandola, accused the alchemists of falsely ascribing works both to Thomas Aquinas and to Raymond Lull.[229] Besides noting that Lull had opposed alchemy in his *Ars magna,* Bellantius argued that both Aquinas and Raymond were too saintly and religious to have engaged in alchemy, an interesting insinuation that that art was immoral and contrary to religion.

[228] *Ibid.*, fol. 228r.

[229] *De astrologica veritate,* Quaestio V, Art. vi: "sicut etiam plerique alchimiste beato Thomae Aquinati ac Raimundo falso alchimiae opera attribuunt, non enim vitiorum occasionem praebuisset beatus Thomas ob eius sanctitatem. Raimundus quoque christianae religioni deditissimus in arte magna ait, Unde flere possunt alchimiste etc."

CHAPTER XXXIX

BLASIUS OF PARMA (BIAGIO PELACANI)[1]

Blasius of Parma is said to have taken his doctorate at the university of Pavia in 1374 and to have taught there for the next four years,[2] but the first mention of him in that university's records as published by Maiocchi[3] is in 1377, when he was on the faculty of arts. The next year he served as an examiner on March 24, but later appears to have left the university, since on October fourth count Galeazzo instructed that he be paid for four months and twenty-three days arrears due him from the commune. Moreover, we find him at Bologna in the academic year 1379-1380, teaching no less than three subjects, logic, philosophy, and astrology.[4] Very likely he was there the previous year, as has been stated, but the roll for that year has not been preserved. He continued there for at least the next two years (the roll for 1382-1383 is missing) teaching philosophy and astrology, but in 1383-1384 his name no longer appears. But on

[1] Revised from *Archeion,* IX (1928), 177-190. F. Amodeo, "Appunti su Biagio Pelicani da Parma," *Atti del IV Congresso internazionale dei matematici* (Roma, 6-11 Aprile, 1908), III, 549-553, held, merely on the basis of the 1505 edition, that the name should be spelled Pelicani, but more original records do not bear out this contention. Franciscus, son of Blasius, seems to have spelled the name, Pellachannis, judging from a MS which belonged to him: S. Marco VI, 62, fol. 18r.

[2] These statements, repeated by such reliable writers as Tiraboschi (*Storia della Letteratura Italiana,* VI, ii, 1824, 497) and Duhem (*Études sur Léonard de Vinci,* III, 483; *Système du monde,* IV, 278), seem based on J. Parodi, *Elenchus privilegiorum et actuum publici Ticinensis Studii,* 1753.

[3] Rodolfo Maiocchi, *Codice diplomatico dell' università di Pavia,* vol. I, 1905: vol. II, without other name of editor than "Società Pavese di Storia Patria", appeared in two parts in 1913 and 1915. As the numerous mentions of Blasius in the records are all carefully indexed, I shall not in most cases cite each passage by page or number of document. Vol. I covers 1361-1400 A.D.; Part i of vol. II, from 1401 to 1440, and Part ii from 1441 to 1450.

[4] For Blasius's connection with the faculty of arts and medicine at Bologna I follow Dallari, *I rotuli dei lettori legisti e artisti,* vols. I and IV, 1888 and 1924. Most of the rolls for the early years are in the last supplementary volume. The index will enable anyone readily to find the mentions of Blasius.

May 20, 1384, we find him present in the chancery of the prince of Carrara, making an agreement to teach philosophy and astrology for four years at the university of Padua,[5] beginning that fall, at a salary of 300 lire per year. His name does not appear in the extant records of that university again, however, until the period from February, 1386, to May 11, 1387, when he presented or examined several candidates for degrees. This absence, like that at Pavia from 1374 to 1377, might be explained on the ground that he would have no students of his own to present or examine until he had taught for a year or two. From May, 1387, until December 16, 1388, his name again does not appear in the Paduan records, which permits him to spend the academic year 1387-1388 at Bologna, where we find his name once more and for the last time on the faculty rolls as professor of philosophy and astrology at the large salary of 200 ducats. If a manuscript, now at Oxford,[6] is correct in stating that Blasius completed his *Summa super libro de celo et mundo* at Bologna, the work might be of this date.

Meanwhile Blasius had been doing more than teach astrology, he had been making practical predictions, sometimes of great political or military moment, as the following story will illustrate. In June, 1386, during a war between the houses of Carrara and Della Scala, he predicted that if the former engaged in battle at the moment, they would win and take their opponents prisoners. At first on the contrary the Scaliger troops routed part of the Carrara army, pursuing it to the town walls, whereupon a bystander derided Blasius for his prediction. But he replied, "You're crazy. Either it will come out as I said, or the heavens will fall."[7] Sure enough, the unrouted portion of the Carrara army then took the pursuers in the rear. Thus caught between two forces, they were taken prisoners, and Blasius's prediction was fulfilled.

Although Blasius is named as a promoter of a candidate for

[5] For Blasius's connection with the university of Padua I use the records indicated by A. Gloria, *Monumenti della Università di Padova* (1318-1405), 1888, I, 415-417: *Studi editi dalla Univ. di Padova,* vol. I.

[6] See Appendix 40; De coelo et mundo.

[7] Gloria (1888), I, 415, "Insanus es: aut quod dixi erit, aut coelum cadet."

the doctorate at Padua in December 16, 1388, and so was still connected with that university, he was represented on that occasion by someone else.[8] Soon his connection ceased entirely, for the next year we find him back at Pavia, teaching "the mathematical arts and both philosophies" (i.e. moral and natural) for lire 53.6.8 *tertiolarum* per month, the highest salary received by anyone with the exception of a few of the law professors. His name now appears in the records at Pavia every year until 1399, when the university was transferred to Piacenza for a short time.[9]

The earliest dated manuscript of a work by Blasius appears to be one written on paper in Pavia in 1385, containing his lectures on Aristotle's *De generatione et corruptione, Meteorology, De anima,* and *Physics*. Perhaps it may be in his own hand,[10] but he appears to have been teaching at Padua that year. According to another manuscript, his *Questions on Perspective* were written at Pavia in 1390.[11]

Blasius had now about reached the height of his reputation. In *Il Paradiso degli Alberti,* written about 1389, he is represented as being then at Florence and is called the most universal philosopher and mathematician of his time.[12] In the fall of 1391 he was given a colleague in astronomy at a salary one-half his own. His works were by this time becoming so well known that we have manuscript copies of them made by others. In 1391 a copy of his *Questions on the Proportions of Velocities in Motions* of Thomas Bradwardine was made by an Andreas de Castello and is preserved in a manuscript at Venice.[13] In 1392 a John of Milan copied his *Dialectical Questions* in the prisons of St.

[8] *Ibid.,* II, 216.

[9] See Appendix 40 for a manuscript of his *Questions* on Aristotle's *Meteorology,* written in this year.

[10] Affò, *Memorie degli scrittori et letterati Parmigiani,* 1789, II, 120-121, who described the MS, then in the Biblioteca Chigi of Pavia, did not state.

[11] See the close of a MS of the work in the public library of Ferrara quoted by Angelo Pezzana, in his continuation of the work of Affò, Parma, 1825-1833, VI, iii, 133.

[12] Ed. of Bologna, 1867, by Alessandro Wesselofsky, III, 3, 18-19; and at I, i, 132-142, a discussion of the chronology of Blasius's career.

[13] S. Marco VII, 38 (Valentinelli, XI, 14), fols. 8-37.

Mark's at Venice.[14] His *Questions* or *Doubts in Perspective* are found in a third Venetian manuscript of 1399.[15] Certainly some and probably all of these works had been composed earlier than the dates of these manuscripts. On Thursday, July 19, 1397, in the third hour of the night, Bernard a Campanea of Verona, a student at Pavia, finished writing a manuscript on the *Questions* of Blasius on the eight books of Aristotle's *Physics*. At the end of each book he praises Blasius, calling him the greatest of doctors of the arts, the flower of philosophy, a profound speculator, and one who shines among other philosophers like gold among the metals. Dating from the same year and found in the same manuscript are other *Questions* by Blasius on the eight books of *Physics*. In still another manuscript at Venice an arrangement of *Questions* by Buridan made by Blasius is dated by Valentinelli about 1396.

In 1396 Blasius appears to have come very close to getting into trouble. He seems to have said something that was regarded as heretical, and to have been temporarily suspended from his academic position. He speedily recanted, however, and was as promptly reinstated. A notarial document recounts that he appeared or was brought before the bishop who asked him if he was dissatisfied with those remarks which he had made against the catholic faith and holy mother church.

And he said he was. Also the bishop asked him if for the rest he intended to hold to the catholic faith and its articles and the decisions of the church. He said that he did, asking pardon for his transgressions. This accomplished, the lord bishop reinstated him in his professorship and salary and accustomed dignities.[16]

[14] S. Marco X, 208 (Valentinelli).

[15] S. Marco fondo antico 335 (Valentinelli, XI, 57), *Super perspectiva communi dubitationes*.

[16] Maiocchi, I (1905), 334. "Die xvi octobris D. Episcopus interrogavit magistrum Blasium de Parma, in eius presentia constitutum, si erat male contentus de hiis que dixerat contra fidem catholicam et sanctam matrem ecclesiam. Qui respondit quod sic. Item interrogavit eum si de cetero volebat tenere fidem catholicam et eius articulos et determinationes ecclesie. Qui respondit quod sic, petans veniam de commissis per eum. Quibus peractis, D. Episcopus restituit eum ad lecturam et salarium solita et honores etc. Mandans michi notario ut inde conficiam instrumentum. Actum in palatio episcopali. Testes: Magister Rogerius de Sicilia rector universitatis medicorum, D. magister Marsilius de Sancta Sophia de Padua, D. magister Francischus de Strazapatis de Papia artium et medicine doctores."

Whether the utterances against the faith and church with which Blasius was charged were connected with his theological treatise upon the theme of predestination or his teaching of philosophy or his astrology does not appear. But it would seem that the sympathy of his colleagues was with him, since on the very day of his recantation he presented as a candidate for the doctorate and the following day examined Hugh of Siena, who was to prove one of the most distinguished physicians and philosophers of the first half of the fifteenth century. The name of Blasius also appears in the three next documents in Maiocchi's collection and continues to occur frequently during the year 1397. It therefore rather seems that his appearance before the bishop was to clear his reputation and almost in the nature of a whitewashing, and that the brief "interrogations" which the bishop put to him should not be regarded as "putting him to the question" in the sense of being accompanied by torture.

Older authorities such as Facciolati, Affò and Valentinelli[17] have stated that Blasius was recalled to the university of Padua in 1400, for a stay of eleven years, but he still appears in the records of Pavia from 1403 to 1407 as lecturing in moral philosophy, astrology, and mathematics.[18] In March, 1407, however, he left Pavia[19] for Padua.[20] At Padua in 1407 he received a salary of 215 ducats, while James of Forlì (Jacopo de la Torre) received 600 ducats. Both men appeared on May 15, 1409, among the sponsors for Prosdocimo de Beldomandis at his examination in arts. When, on April 15, 1411, Prosdocimo was examined in medicine, James was again a sponsor but Blasius was not, pre-

[17] Ireneo Affò, *Memorie degli scrittori e letterati Parmigiani*, 1789, II, 114, citing Facciolati, *Fast. gimn. Patav.*, I, 102; Valentinelli, *Biblioteca MSS. ad S. Marci Venetiarum*. 1868-1876, IV, 153.

[18] Maiocchi, II, 40, 54, 60, 68, 73, 84. A manuscript, however, half suggests that he was lecturing at Padua in 1404: BL Canon. Misc. 181, fol. 64, "Expliciunt questiones utiles super tractatum de latitudinibus magistri Blaxii de Parma per me Vendrarninum scholarem artium 1404, die 19 maii, stante discordia non modica inter Venetos et dominum Paduensem."

[19] As documents in Maiocchi, II, 89 and 98, prove.

[20] Gloria, I, 416; Tiraboschi, VI, ii, 453.

sumably because he was only a doctor of arts and not of medicine.[21] In any case, his connection with the university of Padua was soon to cease. Valentinelli states that Blasius was called "most famous doctor and monarch of all the liberal arts" by his contemporaries, and in a manuscript of the early fifteenth century he is spoken of as ranking among philosophers as the sun does among stars.[22] Yet four years after his return to Padua, on the Ides of October, 1411, the university discharged him on the grounds that he seemed less fit to teach and that his classes were not attended.[23] This was perhaps a decline due to old age since Blasius, who returned to his native city of Parma, died there in 1416. But Tiraboschi, Morelli, and Affò united in ascribing it to his greed for money and crabbedness, and consequent unpopularity with the students.

Some writers have asserted that the students boycotted Blasius because of his treatment of one in particular, Vittorino da Feltre, later famous as a renaissance educator, who was anxious to study mathematics with Blasius but unable to pay the fees and whom Blasius refused to encourage.[24] According to one version of the story, this incident led directly to the boycott and dismissal of Blasius, but according to another version, it must have happened much earlier, since Blasius in his later years, when Vittorino had also grown famous, is represented as regretting that he had not recognized the promise in the youth and enlisted him as a disciple. Still a third version of the story pictures Vittorino as received by Blasius and as serving as a scullery boy in his

[21] Antonio Favaro, "Intorno alla vita ed alle opere di Prosdocimo di Beldomandi, matematico padovano del secolo XV", *Bullettino di bibliografia e di storia delle scienze matematiche e fisiche pubblicato da B. Boncompagni,* XII (1879), 22-25.

[22] Venice, S. Marco, VI, 155 (Valentinelli, XI, 18), fols. 105-112.

[23] Valentinelli, IV, 153: ". . . qui etsi omnium liberalium artium doctor, famosissimus omnium liberalium artium doctor et monarcha a coaevis sit appellatus, idibus octobris anni 1411 dimissus est, quo minus aptus ad docendum videretur eiusque schola auditoribus careret." Affò (1789), II, 114-116, cites Facciolati, I, 102, for the same fact.

[24] Affò, II, 115-116, citing Platina's and Prendilacqua's *Lives* of Vittorino and other later authorities. The passage in Prendilacqua occurs at page 30 of G. Brambilla, *Intorno alla vita di Vittorino da Feltre. Dialogo di Francesco Prendilacqua tradotto e annotato,* Como. 1871.

house in order to learn geometry from him.[25] If, however, we accept 1376 or 1379 as the year of Vittorino's birth, it hardly seems as if Blasius could have had such relations with him while teaching at Padua, since at the time of Blasius's first residence there from about 1384 to 1387 Vittorino would have been but from five or eight to eleven years old and too young to attend a university, while at the time of Blasius's second residence, 1407-1411, Vittorino would have been around thirty and too old to study such subjects or to serve as a scullery boy. Moreover, with Blasius dying five years later, he would have little time to note Vittorino's advancement and regret his earlier action. Vittorino did not found his famous school at Mantua until nine years after the death of Blasius. There therefore seems to be something wrong with all versions of the tale, although it is of ancient origin.

At some time during his long career Blasius was in Paris, a fact to which he adverts in his treatise on weights, but whether as a teacher or in his student days or simply at some time as a visitor does not appear. A manuscript of Blasius's commentary on the *Sphere* of Sacrobosco calls him "Blasius of Parma the Parisian," and so was perhaps written while he was in Paris.[26]

Whether the great reputation which Blasius had enjoyed among his contemporaries was already somewhat dimmed at the time of his dismissal from Padua or not, it would seem to have been considerably diminished by the close of the fifteenth century, since only two of his works were printed.[27] Yet Luca Pacioli, who flourished during the closing years of the fifteenth and opening years of the sixteenth century, testified that he had been helped by Blasius's works in the composition of his celebrated *Arithmetic*. On the other hand, Antonio Guaineri or de Guayneriis, a medical writer and professor[28] of the first half of the

[25] P. Monnier, *Le Quattrocento,* 8th ed., 1924, I, 177.

[26] Affò, II, 124.

[27] Namely, the questions on the latitude of forms and on the touching of two bodies—the former in 1482 and 1486, and both together in 1505. The Bibliothèque Nationale of Paris has the 1505 edition; the British Museum has it and also the 1486 edition.

[28] His name appears in the records of Pavia as professor lecturing on medicine in 1412 at a salary of 200 florins and in 1448 of 300 florins: see Maiocchi, II, 123, 534-535, 538-539. See also our subsequent chapter on him.

fifteenth century who is said to have been one of Blasius's students regarded him as silly and fantastic in medical questions, which it is true were hardly his forte. Francesco Pelacani of Parma, the son of Blasius, who received the licentiate and doctorate at Pavia in 1422 and then taught there for many years, first logic at a salary rising from thirty florins in 1423-1424 to eighty florins in 1430-1433, then in 1434 natural philosophy as well as logic, with an increase of twenty florins in salary to compensate, and then natural philosophy at a salary mounting from 125 florins in 1435 to 480 florins in 1448,[29] seems to have helped keep his father's memory green. In 1445 one of his students made a copy of Blasius's *Perspective*.[30] That this work maintained its currency for a considerable period after Blasius's death is further indicated by extant manuscript copies of it made in 1428 and 1469.[31] And in the 1445 copy a Matheus de Capitaniis de Busti, recording his examination for the doctorate in arts on June 27, 1438, in listing Franciscus Pelacanus as one of his promoters states that he was the "son of master Blasius who composed this book."[32] On the whole, more manuscripts of Blasius's works seem to date from his lifetime than from after his death. Burtius, however, in his *Bononia illustrata,* published in 1494, ranked Blasius as one of the four greatest citizens of Parma along with Cassius the poet, Cassius the centurion, and Macrobius. He described Blasius as a most eminent philosopher and astrologer whose commentaries on the mathematical arts were in print and who was buried with Macrobius in one and the same sepulcher.

[29] This year is as far as the records printed by Maiocchi carry his career: see Maiocchi, II, 203, 212, 222, 240, 247, 266, 269, 282, 293, 304, 308, 310, 356, 395, 433, 447, 449, 470-471, 481, 485, 496, 519, 524, 539. Maiocchi indexes separately the name "Antonius de Pellacanis," which appears in the Rotulus for 1434 as teaching both logic and natural philosophy, but it is evidently a slip for Francesco whose name does not appear that year.

[30] MS Ambros. G. 71, and Affò, II, 123.

[31] FL Plut. 29, cod. 18; Vatican Barberini 357, fols. 61-107.

[32] Affò, II, 166. This document, which was printed in full by Affò, and runs on to page 168, listing also all the professors who participated in Matheus's examination in medicine in 1441, has been overlooked and not included in Maiocchi's collection. Matheus states that his studies at Pavia extended from November 3, 1433, to June 10, 1441.

The writings of Blasius may be grouped, since their chronological order of composition seems undetermined, either according to the fields of knowledge to which they apply, such as mathematics, physics, logic, psychology, theology, astronomy, and astrology, or according as they are commentaries upon the works of Aristotle or more recent medieval writers. Of his Aristotelian commentaries we have already had occasion to mention the two sets of *Questions* on the *Physics,* and his exposition of the *De anima, De coelo et mundo, Generation and Corruption,* and *Meteorology*. Perhaps some of his logical treatises may be reckoned as commentaries on the corresponding works of Aristotle. Other dialectical writings than the *De predicamentis,* which alone is listed by Affò, are contained in the manuscript written in 1392 in the prisons of Venice to which we above referred.[33] Blasius also commented upon the logic of Petrus Hispanus. A discussion of predestination was taken by another doctor of arts and medicine, Saladinus of Rome, from a theological work composed by Blasius.

Of medieval scientific writings Blasius commented upon the *Sphere* of Sacrobosco, the *De ponderibus* of Jordanus Nemorarius, and the *Perspectiva communis* of John Peckham, three standard works of the thirteenth century, and, coming to the fourteenth century, upon the treatises on proportions of Bradwardine and on the latitude, or remission and intension, of forms current under the name of Nicolas Oresme. This *De latitudine formarum* upon which Blasius commented is, however, probably not by Oresme but a résumé by some disciple of his *De difformitate* or *De configuratione qualitatum,* compared to which it is a dry compendium.[34] The discussion by Blasius seems to consist of only three questions, but he also composed a somewhat longer work on intension and remission of forms. It may be noted that none of the writers commented upon was, like Blasius himself, an Italian, but that they came from England, France and Ger-

[33] The various MSS of Blasius's works are described together in Appendix 40.

[34] Duhem, III (1913), 399 and 483.

many. He less commented upon than arranged certain questions of Jean Buridan, also of the fourteenth century.[35]

Blasius is said to have written on arithmetic and algebra, but I have not come across any manuscripts of such works. Possibly he was author of a spherical geometry. At any rate geometry entered a good deal into his works in the fields of astronomy and physics. He treated of that common subject, the theory of the planets.[36]

In his commentary on the *Perspectiva communis* Blasius selected only a limited number of Peckham's numerous propositions for further treatment,[37] but went into them so fully that his commentary is much longer than the original *Perspectiva communis*.

The only copy of the work by Blasius on weights which I have seen occurs in the same manuscript with the *De ponderibus* of Jordanus Nemorarius. It is not exactly in the form of a commentary upon that author but is similar to his work in matter and method and pretty plainly is based thereon. The treatise of Blasius, however, which divides into three parts, is the fuller and more developed of the two, but it cannot be considered very original. Blasius of course adheres to the then usual Aristotelian notions of heavy and light and of natural and violent motion.

The treatise of Blasius is Euclidean in form. Propositions are stated and then proved by reference to accompanying geometrical figures in the ample margins. The figures are lettered and portions are colored in yellow. Some of the propositions are followed by corollaries. The opening proposition is that the arms of a balance, if they be equal, in revolving describe two opposite and equal quarters of the same circle. The next proposition is that any weight not already in its natural place or otherwise detained tends to fall in a straight line rather than in a curve. Therefore, since the arms of a balance describe arcs, the descent

[35] S. Marco X, 103 (Valentinelli), about 1396 A.D., fols. 83-84, Elenchus questionum (eiusdem Buridani) ordinatarum per me Blasium de Parma.

[36] Vatic. 3379, fols. 52r-61r.

[37] Blasius discusses sixteen questions from the first book, five from the second, and three from the third.

of a weight placed in a balance is not absolutely natural. Nor is it violent, since by such motion it seeks its natural place, but it is midway between natural and violent motion. The third proposition is that the circumference of a small circle curves more than that of a large one. Fourth, in the small circle a greater arc curves more than a smaller one. Fifth, of equal arcs of the same circle which are at different distances from the line of direct descent, the less distant deviates the more from the perpendicular. An object is heavier, the more directly it moves towards the center of the earth. Consequently the more a balance is raised, the heavier becomes a weight placed in one of its arms, while a weight descending in a balance is continually retarded in its motion.

In the second part of his work Blasius continues to deal with the balance, touching on such matters as center of gravity, the proportion between the length of the arms of the balance, and the weight necessary to counterbalance another.

In the third part, however, he turns to the problem of determining relative weights by some other method than that of the balance and cites the work of Archimedes (*Alaminides* in our MS) on floating bodies. Although Blasius adopts the Aristotelian doctrine that heavier elements seek to be below lighter ones and lighter bodies seek to rise above heavier ones, he seems to prefer the dictum of Archimedes that no element has weight in its own region to the assertion—which he ascribes to the great Academician (*sic*) Aristotle in his volume on the universe (*De celo et mundo?*)—that every element except fire has gravity in its own region. "Which philosophy," says Blasius, "displeases many and contributes nothing to our discussion." Blasius now explains that bodies are equally heavy, when, "maintaining the same quantity and figure," they weigh the same. Identity of figure or shape as well as of quantity is requisite because difference in shape causes alteration and slowness of motion. "Now the greater or less heaviness of a body is not known unless by its swifter or slower movement." A piece of wood, if big enough, is heavier than a certain amount of lead, but "in the same extension" lead is heavier than wood. To compare such weights without use of the balance,

Blasius would, in the case of solid bodies, see which would sink or float in water; or, if both sink, which would sink faster and reach the bottom sooner; or, if both float, which is submerged the more or which one rises more quickly to the surface, if both are simultaneously released from the bottom. Another method would be to take two equal weights and tie either with threads of equal length to the two objects to be measured, pass them through a suspended ring, and note which descended or ascended the more slowly. Blasius would test the weight of different liquids by seeing how deep the same floating body was submerged in each. He would compare the weight of a solid and liquid by noting whether the solid sank in the liquid, or floated upon it. If it submerged so that its upper surface was level with the surface of the liquid, then they would be of like weight. In estimating the credit which should be given to a later writer, such as Nicholas of Cusa for his *Static Experiments,* earlier treatises like this of Blasius should not be forgotten.

The *Judgment of the Revolution of the Year 1405* by Blasius, dated March eleventh,[38] is one of a numerous series of such annual predictions made by professors of Italian universities which have come down to us. Blasius prefaces his prediction with two propositions, each accompanied by two additional corollaries, saving the divine control of the stars and human free will. Having thus made his peace with orthodoxy and asserted that "Only the rational creature can resist the stars when it will,"[39] Blasius opens his forecast, which is on the whole of a gloomy sort, couched in darksome and enigmatic language. "With the earth cooked by subterranean fire, water will gush forth in the fashion of blood over its arid surface," and there will be threatening gales, gathering glooms, coruscations, thunderbolts, snow-storms, and comets. The summer will be very dry and buildings will burn down. There will be shipwrecks on the agitated waters and other ills, while an abundance of wine, butter, oil, and grain

[38] BN 7443, fols. 11v-17r, "Iudicium revolutionis anni 1405 11 marcii cum horis et fractionibus secundum magistrum blasium de parma."

[39] *Ibid.,* fol. 11v, "Sola rationalis creatura astris resistere potest cum velit."

will be accompanied by an increased price.[40] This may seem to be taking a bold liberty with the law of supply and demand, but Blasius throughout is careful to give astrological reasons for his conclusions, stating the positions of the stars on which they are based.

Blasius devotes his second chapter[41] to the topic of the pest, since medical men have importuned him more than others to inform them upon that point. They submit that death is the last and most terrible thing in this world, and it would be preferable to be tormented through eternity than to cease to exist. It is Blasius's opinion that many animals such as horses, mules, and camels will succumb to the pest during the ensuing year, and that various ills difficult to cure will be generated in human bodies, corrosive complaints in head and intestines, shoulders and shins, with thick and sticky pus. Many, especially the young, will suffer from venereal disease with tremor of the heart, and of these many will die. Many others will be disposed to leprosy. There will be an eclipse of the moon portending an outbreak of the plague.[42]

With his third chapter Blasius turns to the military class who seek to learn "whether in the present year all things will be common to all men, than which there is nothing better, as they assert. For who would choose to live without friends to whom all things are most freely conceded?" Is Blasius ironical here, and, if so, were his remarks concerning death at the beginning of the previous chapter likewise ironical? Castles, cities, suburbs, and friendship will be partially preserved, but some accusations and quarrels will arise, and the poor will rise against the rich.[43] There will be many illegitimate births. In the fourth chapter Blasius also foresees contentions among the clergy.[44] The fifth, last, and longest chapter deals with the emperor, kings, and

[40] If such be the meaning of fol. 12r, "copia vini butiri olei et frumenti non exclusa precio predictorum adaucto."

[41] *Ibid.,* fol. 12v.

[42] *Ibid.,* fol. 13r.

[43] *Ibid.,* fol. 13r, "Depressionibus (de possessionibus?) extimo pauperes cum divitibus infallibiliter excitari."

[44] The chapter opens at fol. 13v, "Presenti anno religiosorum contentiones videntur insurgere. . . ."

various Italian cities such as Milan, Pavia, Genoa, Rome—which will suffer many afflictions, Florence—which will be free from them, at least for part of the year. As for Bologna, "mother of studies," Blasius would prefer to keep silence but he cannot lest concealing the truth do them (studies?) harm. Venice's war with her neighbors will continue. Blasius concludes by describing the appearance of a tailed star or comet which will bring in its train mortalities, drought, and wars.

Simon de Phares mentioned this prediction by Blasius for 1405 and also ascribed to him a prediction of the comet, called Verru, which appeared on February 25, 1402, and of the death of Charles d'Orléans from his nativity which Simon incorrectly placed on February 21, 1403.[45] In succeeding chapters we shall note another discussion of the comet of 1402, and then some specimens of annual astrological judgments in the thirty years following that of Blasius for 1405.

We may not inappropriately associate the name of Prosdocimo de' Beldomandi with that of Blasius of Parma, since they were fairly closely related both in space and time, and Blasius was among the examiners who conferred upon Prosdocimo in 1409 the licentiate in arts at the university of Padua.[46] This date, however, also indicates that if the period of mature productivity of Blasius fell partly within the fourteenth century, that of Prosdocimo belonged entirely to the fifteenth, although he was born in the former. Prosdocimo, however, had also been a student in arts at Bologna, for an Ashburnham manuscript now at Florence contains a copy of the *Canons* of John of Saxony upon the Alphonsine Tables, "written by me, Prosdocimo de Beldomandis, of Padua, studying in arts at Bologna, Amen."[47] Already

[45] *Recueil des plus celebres astrologues . . .*, ed. E. Wickersheimer, 1929, pp. 239, 242.

[46] On Prosdocimo the chief study is Antonio Favaro, "Intorno alla vita ed alle opere di Prosdocimo de' Beldomandi, matematico padovano del secolo XV," in Boncompagni's *Bullettino di Bibliografia e di Storia delle Scienze matematiche e fisiche,* XII (1879), 1-74, 115-251. Duhem, *Système du monde,* IV, 289-301, reviews its findings and adds some account of Prosdocimo's commentary on the *Sphere* of Sacrobosco.

[47] FL Ashburnham 132 (206 or 138), fols. 11v-19, "Expliciunt canones magistri Iohannis de Saxsonia super tabulas regis Alphonsi scripti per me Prosdocimum de Beldemandis (*sic*) de Padua in artibus Bononie studentem, Amen."

before receiving the degree Prosdocimo had written in 1404 and 1408 commentaries upon the works on music of the fourteenth century Parisian scholar, John de Murs. In 1410 he attacked the theoretical or speculative part of the *Lucidarium* of Marchetto of Padua, written back in 1274. In 1411 he received his licentiate in medicine. In 1412 and 1413 he produced yet other musical treatises.[48] He finished his commentary on the *Sphere* of Sacrobosco in 1418; from 1422 on he was professor of astrology at Padua, where his *Canons* were composed in 1424 and perhaps others on the Tables of James de Dondis in 1426.[49] Besides other astronomical works which cannot be precisely dated, he wrote on arithmetic and geometry. Thus he covered the entire quadrivium, but it is his astrology in particular which here interests us. His "Canon for finding the time of the entrance of the sun into each of the twelve signs of the zodiac," and his "Canon for finding the entrance of the moon" into the same, suggest it, but it is especially evidenced by his treatise on elections, "very brief, . . . according to the place of the moon in its twenty-eight mansions." This work seems to be dated in the year 1413, and professes to follow the doctrine of India on elections.[50]

[48] *De contrapunctu, Tractatus planae musicae, Libellus monocordi.* Some of his musical treatises are printed in Coussemaker, *Scriptorum de musica medii aevi nova series,* 4 vols., 1863-1876; others are still in MSS.

[49] Prag 2436, 1454 A.D., fols. 2r-9r: M. Prosdocimi de Peldemando Paduani Canones tabularum astronomicarum Iacobi de Dondis Paduani, "Facta et ordinata sunt quam plurima . . ."; dated at Padua, 1426, copied 1454. Since the incipit is the same as that for the tables of 1424, I suspect that the date 1426 is a slip.

[50] Biblioteca del Liceo Musicale di Bologna, A. 56, fols. 135-137, "Nichil prestantius in humano regimine apud quemlibet censeri videtur quam uti provisione . . . / . . . Cavendum ergo tunc a cuiuslibet operis initio. Et sic sit finis huius brevissimi tractatuli de ellectionibus secundum situm lune in suis 28 mansionibus per Prosdocimum de Beldemandis patavum ab ellectionibus Indorum anno domini 1413 in castro montagnane paduani districtus taliter extracti Deo gratias. Amen. Explicit brevis tractatulus de ellectionibus secundum situm lune in suis 28 mansionibus per Prosdocimum de Beldemandis patavum ab ellectionibus Indorum taliter extratus Deo gratias Amen."

CHAPTER XL

JACOBUS ANGELUS ON THE COMET OF 1402

Simon de Phares mentions two other predictions from the comet of 1402 besides that by Blasius of Parma. Gilles de Louviers, a canon of Paris, who in connection with the revolution of 1399 had already forecast the comet of that year, also predicted from the comet of 1402.[1] Peter of Monte Alcino, who was at that time "reading the arts" at Paris—that is, either a student or lecturer in the liberal arts—likewise based a prognostication upon the comet which appeared on February 25, 1402, in the twenty-eighth degree of Aries under the planet Mars.[2] We have now to note yet a third work by a man whom Simon does not mention.

The comet of 1402 evoked a brief treatise on comets in general and that one in particular by a Iacobus Engelhart, as he is called in a manuscript copy of the work at Erfurt,[3] or Iacobus Angeli, as he is called in the incunabulum edition, printed at Memmingen in Bavaria about 1490.[4] In both cases he is called

[1] *Recueil* (1929), p. 236.

[2] *Ibid.*, p. 241.

[3] Amplon.Q.353, fols. 178-193. Schum, who in his *Verzeichnis* dated this manuscript as of the very close of the fourteenth century, does not seem to have noticed its references to the years 1400, 1401, and 1402, although he speaks of its tracing the appearance of comets down to the 1380's. His description of our treatise is as follows.

"Iacobi Engelhart magistri Ulmensis tractatus de cometis. Inc. tract. nowus de com. valde subtilis et bonus. Multi mirati fuerunt de apparitione comete stelle . . . ob honorem . . . illustris principis domini ducis Leupoldi, ducis Austrie et Stirie, ac eciam ob reverentiam et utilitatem dominorum meorum magistri civium atque consilii civitatis Ulmensis . . . / . . . peccatis resistere et ad vitam eternam. . . . Spiritu sancto, am. Expl. tract. now. de com. edit. in Ulma per dom. mag. Iac. Engelh." The printed version does not end thus.

[4] The Cornell university library, which possesses the only copy of this incunabulum mentioned in CFCB, very kindly sent the same to New York for my use. It is made up of two quires of three paper sheets each folded in two (A and C) and one of two such sheets (B). See Hain *1099 and 5541; GW 1891; Proctor 2807; Pellechet 758; *Catalogue of Books Printed in the Fifteenth Century Now in the British Museum*, II, 608. On the recto of the first leaf is printed simply, "Tractatus de cometis." On its verso is a table of the ten chapters. At the top of fol. a 2 recto occurs the heading, "Incipit tractatus de apparitione comate stelle." The introduction then opens, "Multi mirati fuerunt de apparitione comate stelle que apparuit his diebus . . ." The first chapter begins towards the bottom of the same page.

"of Ulm, master in arts and licentiate in medicine, physician of the illustrious prince, Leopold, duke of Austria and Styria."[5] In beginning his treatise he expresses his gratitude to the magistrates, council, and citizens of Ulm for the many benefits which they have bestowed upon him.[6] He mentions Swabia as if a native rather than a stranger resident there. He had been in Paris in 1382, very likely as a student. Apparently he may not be identified with the Jacobus Angelus who, together with Guarino of Verona, in 1393 returned with Chrysoloras from Venice to Constantinople in order that they might learn Greek, and who in 1406 translated the *Cosmographia* of Ptolemy, dedicating it then to Gregory XII and in 1409 to Alexander V.[7] This translator was a Florentine,[8] called Giacomo d'Angelo da Scarperia by Vespasiano da Bisticci in his life of Traversari but associated by some with the Acciaioli family,[9] and seems to have died soon

[5] The colophon of the printed edition reads: "Compilatus est iste tractatus et completus per Iacobum angeli de ulma magistrum in artibus ac licentiatum in medicinis phisicum illustris principis principis ducis Leupoldi ducis austrie."

[6] See the quotation from the manuscript by Schum in note 3 above. In the printed edition on the first page of text before the first chapter begins we read, ". . . ad laudem precipue domini nostri ihesu cristi et gloriosissime semper virginis marie et ob honorem et utilitatem illustris principis domini mei ducis Lewpoldi ducis austrie stirie etc. Ac etiam ob reverentiam et utilitatem dominorum meorum magistro (*sic*) civium atque consulem (*sic*) civitatis ulmensis et ob totius communitatis profectum civitatis predicte, his enim post deum propter impensa mihi beneficia quam plurima pre cunctis plus obligor ad serviendum."

[7] For the date 1406 see *Claudii Ptolemaei Geographiae codex Urbinas Graecus 82 phototypice depictus*, Tomus prodromus, J. Fischer, De Cl. Ptolemaei vita operibus geographia praesertim eiusque fatis, Pars prior commentatio, 1932, pp. 191, 207, etc.

[8] In a MS of his translation of the *Cosmographia* at Naples (V.F.32, folio, membrane, with fine colored maps) the rubric of the prologue reads, "Prologus Iacobi Angeli Florentini in translationem Cosmographiae Claudii Ptolomaei Alexandrini"; and in the text he speaks of "our city" of Florence—"licet hoc ipsum nostrum seculum in civitate precipue nostra Florentina."

[9] The catalogue in long hand of the MSS at the Biblioteca Nazionale, Naples, so styles him in connection with the MS mentioned in the foregoing note, but the name of the famous Florentine family did not seem to appear in the MS itself. There is, however, another copy

after "in the flower of his youth."[10]

A Jacobus Angeli was professor at Montpellier in 1426, and chancellor there from 1433 to 1455, and was the physician whom Jean Gerson censured for superstitious observance of certain days.[11] We also hear of a Jacobus Angelus of Ulm who came up for the baccalaureate at Vienna on March 4, 1414, but was put off till Pentecost because he had struck another student in class so that he bled. Only by the intercession of certain masters and by apologizing to the faculty did this Jacobus finally obtain his degree. He was admitted to examination largely because of his father, "who had aided the university and faculty in many ways." In 1417 this Jacobus was admitted to the baccalaureate at Paris and advanced to the licentiate.[12] These dates would seem too late for the writer on the comet of 1402, but he may have been the father referred to. In that case it may have been his son of like name who appears as professor at Montpellier from 1426 on.

An Angelo d'Aquila who completed a medical treatise on the stone at Paris on December 31, 1415,[13] appears to have been a different person from any of the foregoing.

The *Tractatus de cometis* occupies roughly sixteen leaves both in the Erfurt manuscript and the incunabulum edition, and comprises ten chapters, whose headings, James says, will appear as he proceeds. In the edition, however, they have also been collected as a preliminary table of contents. James modestly represents his treatise as a repetition of what has often been stated before, and the first part on comets in general seems largely

of the geographical work of Ptolemy in Naples V.F.33, a MS which I did not get to examine and which may give the name of the translator as Acciaiolo, although from the catalogue I was not sure if it contained the prologue of the translator.

[10] Bartholomaeus Facius, *De viris illustribus, liber nunc primum in lucem erutus. Recensuit vitamque auctoris addidit Laurentius Mehus qui nonnullas Facii aliorumque epistolas adjecit,* Florence, 1745, p. 9: ". . . nisi eum in ipso iuventae flore immatura mors oppressisset."

[11] P. Pansier, "Les maîtres de la faculté de médecine de Montpellier au moyen âge," *Janus,* X (1905), 65.

[12] *Auctarium chartularii Universitatis Parisiensis,* II (1897), 220, 225, 226.

[13] BN 4120, fols. 89r-109v. Some further account of it is given in our chapter on Gerson.

based upon Albertus Magnus's commentary on Aristotle's *Meteorology.* After citing various opinions of the ancients as to comets, including that of John of Damascus that they were special divine creations and lasted only a short time, and that of Seneca that they were stars, not of the nature of the elements, which now appeared and again receded but were not extinguished, and of moderns who tried to explain them as reflections of planetary light, James adheres to the Aristotelian doctrine that comets are earthly exhalations. Natural philosophy distinguishes five species of comets, but the astrologers note nine kinds which are repeated after Guido Bonatti, while nine chief effects of comets are taken from Albertus Magnus.

More original is the account of the present comet which occupies James from chapter six on. It first appeared about the beginning of February, 1402, and was still visible in Ulm on the fifteenth of March. James describes its location in the firmament, size, color, and his observations of it. When it first appeared, Mars was in the last *facies* of Aries. At that time he did not see the comet but later came to the conclusion that it was in conjunction with Mars in the third and last *facies* of Aries.[14] So that at times a circle passing through the poles and middle of the sky would have passed through both their centers. On the twenty-second of March the comet was seen at the second hour near the sun at the distance of a lance to the north. Hence it was clear that it had moved over a great space from north to south. Finally it disappeared on the feast of the Passover, that is to say, the 26th or 27th of March. However, a vestige of it appeared in the east before sunrise, where James saw three long thick hairs, and after sunset he saw one hair in the west. Since both Mars and Aries are hot and dry, these will be the characteristics of the influence of the comet.

James then gives further evidence of his personal observation

[14] Edition of Memmingen, cap. 6, "Et nota quod circa principium apparitionis eius Mars fuit in ultima facie arietis vel circa eam, sed tunc non vidi cometam, sed postea per locum lune inveni quod cometa debuit similiter esse in tertia facie seu ultima arietis, unde nulli dubium quod Mars venit ad coniunctionem comete."

of meteorological phenomena by describing three "dispositions in the air" which had preceded this comet. In 1399 on the eve or day of the conversion of St. Paul, after sunset when it was too dark to see indoors without a light, there was a universal and uniform light in the air which lasted longer than a coruscation and rendered everything visible even in the back parts of the houses. It was not from sun, moon, or star, or from any reflection of light, but must have been the result of some widespread exhalation which produced a flame throughout the horizon. The second apparition was in the autumn of 1400, when there passed slowly through the air from west to east a long flame with a head like a calf and narrowing sharply towards the tail. It vanished on the pinnacle of a house while James was watching it. Similar fires were seen at evening twilight in other places at the same hour. The third event was thunder storms during the past year 1401 from April to the end of August, wreaking such damage as no one could remember. James concludes that these phenomena were precursors of the present comet and marked the elevation of many exhalations from the earth, and that therefore the effects of the comet will be felt especially in this same region of Swabia.[15]

Since men who live in the seventh clime are vengeful of injuries, naturally high spirited, easily moved to wrath and war —the Swabians, Franconians, Bohemians, Hungarians, Turks, Lombards, Italians, and the French rejoicing especially in arms and instruments of war—the comet will have more effect on them than on other peaceably inclined folk. Should, however, the comet be powerful enough to provoke these pacific men, they might, once aroused, be fiercer in their wrath than the others.[16]

Astrologers approach the question of what regions the comet will most affect from a somewhat different angle than that of our previous paragraph, and state that its signification applies to

[15] I reproduce in Appendix 42 the Latin from the seventh chapter as a specimen of early fifteenth century description of meteorological phenomena.

[16] Edition of Memmingen, page bearing the signature C 2, ". . . verum est quod tales homines magis pacifici possunt provocari propter causas dictas et tunc fiunt aliquando seviores aliis."

those regions towards which its tail is erected. On this basis James concludes that Spain, France, England, Scotland, and lower Germany are countries threatened.[17] The comet of 1382 was followed in 1385 by a conjunction of Saturn and Jupiter on April eleventh in the 26th degree of Gemini, by a conjunction of Saturn and Mars on June fifteenth in the fourth degree of Cancer, and by a conjunction of Jupiter and Mars on the twenty-eighth of June in the twelfth degree of Cancer. There ensued an unusual number of ills in the same year. Therefore James is fearful of what will happen in 1405, three years after the present comet when, on January twelfth, Saturn and Jupiter will be again in conjunction.[18]

In his ninth chapter James gives examples of the signification of comets in the past from the chronicles of the ancients and of the moderns.[19] Mention is made of three comets in succession in the reign of Nero, when Peter and Paul were spreading Christianity; of another under Vespasian which preceded the burning of the capitol at Rome and destruction of Jerusalem by Titus; and of others which immediately heralded the deaths of Constantine and Justinian. Another marked the Norman conquest of England; another, the defeat of Alexius, emperor at Constantinople, in the time of the emperor Henry; while a third in the reign of Frederick II is connected with his wars in Lombardy, struggle with the papacy, imprisonment of his oldest son Henry, the expulsion of the Saracens by the king of Castile, and the conquest of Majorca by the king of Aragon. The defeat and capture of many Pisans by the Genoese was preceded by a comet.[20] Guido Bonatti[21] mentions a comet in the Arabic year

[17] See "Capitulum octavum de significatione huius comete secundum viam astrologorum" (verso of page bearing signature C 2 in the edition; fol. 189v in Amplon.Q.353).

[18] Edition of Memmingen, page with signature C 3 in the edition.

[19] "Capitulum nonum in quo ponuntur exempla (ex) cronicis antiquorum et modernorum super significatione cometarum" (beginning on the verso of page C 3 in the edition, and at fol. 190r in Amplon.Q.353). The chapter opens, "In antiquis historiis legitur in multis locis. . . ."

[20] Presumably the fatal battle of Meloria in 1284 is meant, but in this instance both edition and manuscript, which seldom agree in the figures of their dates for the other comets, give the year as 1299.

[21] Amplon.Q.353, fol. 191r, "Item Guido

663, which our manuscript interprets as 1262 A.D., our incunabulum as about 1260, but which would be nearer 1265. Our author states that Thomas Aquinas and Albertus Magnus were living then, while pope Alexander (presumably Alexander IV, 1254-1261) was dead. The deaths of Manfred[22] and Conradin and of a brother of the king of Castile named Frederick followed. With either of the last two perished many nobles. "And many evils which lasted quite a while came after that comet."[23]

Coming to comets of the past century, James notes that a certain author in his tractate on causes of the pestilence recites that he had seen a comet in the year of the Lord 1337 about the feast of St. John the Baptist. Then began the very lamentable war between the kings of France and England. In 1340 on the nativity of John the Baptist there was a naval battle between them in which about thirty thousand men were killed, drowned, and captured. From this allusion to the battle of Sluys James jumps to that of Roosebek in 1382, which followed scarcely two months after the appearance of a comet while he was at Paris about the time of the feast of the nativity of the blessed virgin Mary. The French king had a great army with more, it was said, than one hundred thousand horses, while thirty thousand men, mostly citizens of Ghent, were slain in the battle. Most modern historians would certainly regard these figures as grossly exaggerated. But inasmuch as our author was in Paris at the time, his account of the suppression of the popular uprising there by the king on his return may have some value. He then tells of the disastrous expedition of Louis of Anjou to Italy, of the progress of the Hundred Years War in 1383, of the quarrel of Urban VI with his cardinals and his total disappearance for ten weeks, of Sigismund's expulsion and return in Hungary, of Italian politics in 1385-1386, and of events in Swabia from 1386 to 1388. Such disturbances, protracted for six years after the

Bonattus in libro suo de revolutionibus annorum circa finem in capitulo de cometis."

[22] In this connection the name of Charles of Anjou is spelled Scarlottus in the manuscript and Scharlottus in the incunabulum.

[23] "Et multa mala venerunt post illum cometam que satis diu duraverunt."

appearance of the comet in 1382, seem to him to teach the lesson that, as the sea remains wave-tossed for some time after the storm has died down, and as diseases leave their disagreeable sequels, so the effects of a comet are not fulfilled in the first year following, and this should be kept in mind with regard to the present comet of 1402. If, in narrating the events of 1382-1388, he has not always got the dates precisely correct, he is sure that they are not far off and that it happened as he has stated.[24]

The tenth and last chapter, "in which is shown that loyal catholics ought not to mind this or other significations of the stars but commit everything to God," is in the nature of a pious sedative to the terrors which James has previously been arousing. He laments the sins of the present time, which are a worse evil than any comet or stars can bring. God can temper all the adversity of this world, regulate the elements, and change the natures of the stars which are contrary to the human race into healing medicine.

The comet of 1402 was hailed in Wales as a sign favorable to the rising of Owen Glendower, and, we are told, "was compared with the star of Bethlehem as the herald of a deliverer."[25]

[24] I reproduce the Latin text of his account of these years in Appendix 41 as of some possible historical value.

[25] Review of J. E. Lloyd's *Owen Glendower* in *The Times Literary Supplement,* Dec. 10, 1931.

CHAPTER XLI

ASTROLOGICAL PREDICTION: 1405-1435

Three years after Jacobus Angelus discussed the comet of 1402 at Ulm, a Henry Andrea of Gislingen made an annual prediction for 1405 at the request of someone whom he addresses as venerable lord and master.[1] He was a master of arts and doctor of medicine. He engages for three or four pages in a general discussion and defense of astrological influence before beginning the actual prediction, and then again takes into account the conjunction of Saturn and Jupiter in January before considering the entry of the sun into Aries in March and the revolution of the year. The prediction is distributed under such topics as the state of kings, "pope, cardinals, bishops, abbots, and all spiritual persons," people, crops, war and peace, women and girls, monks, weather, and disease. But Henry believes that sickness and pest may also be a divine judgment for human sin and cites many Biblical examples.

The prediction by Blasius of Parma for this same year, 1405, has already been noted. Yet another judgment for that year was by master Melletus de Russis of Forlì who at the time was staying in Cesena.[2] For the sake of brevity he gives only his conclusions, omitting the astrological reasoning on which they were based. He takes up the four quarters of the year in turn, giving

[1] Vatic. Palat. 1438, fols. 54r-61v (old numbering of some previous MS of which this tract once was a part, 67r-74v), "Ad laudem et honorem summi creatoris qui speraru celestium multitudinem . . . / . . . sunt scripta sicut petivistis submittens me super hiis vestris et aliorum correctionibus benignis."

[2] BN 7443, fols. 23r-32v, opening, "Iudicium factum per magistrum Melletum de Russis (?) de Forlivio Cesene commorantem super anno 1405 post meridiem 11 marcii abreviatum per conclusiones omissis probationibus causa brevitatis. Et quia anni distinguantur in 4 partes posuit conclusiones cuiuslibet 4 per se ut clarius appareant intuentibus stellarum significata (?)." Simon de Phares (1929), pp. 243-244, has described this prediction for 1405 of "Maistre Meletum de Russis de Forlivio" and was perhaps acquainted with this very MS of it.

sixteen conclusions for the first three months, seventeen conclusions for the second quarter, and thirteen and fourteen for the third and fourth quarters respectively.[3] He then appends some general conclusions applicable to the year as a whole. Simon de Phares states that the astrological skill of this Melletus was much appreciated at the council of Constance in 1416.[4]

We also learn from Simon de Phares that Rogier de Saint Symon, a doctor of medicine and astrologer at Poitiers, made a prognostication on the revolution of the year 1406, in which he correctly predicted popular uprisings in Guienne, Auvergne, and Limousin.[5] About the same time (in the previous year according to Simon, but actually it must have been much earlier) Jehan Charles, a prominent churchman at Paris, had predicted from the revolution of the year the unfortunate outcome of the Neapolitan expedition of Louis of Anjou, the brother of Charles V.[6] Charles d'Orgemont, a doctor at Paris, arrived at a like conclusion from the revolution of the nativity of the duke of Anjou, the year that he was in Naples. Nicolle des Plains, a Parisian doctor of theology in the employ of the duke of Orléans—presumably Louis who was assassinated in 1407—besides drawing up the duke's nativity, predicted from the eclipse of June fifteenth the death of pope Alexander V and the destruction of Liège by the duke of Burgundy.[7] Since Alexander died in 1410 and Liège was punished by the duke in 1408, the eclipse meant is probably that of the sun on June 16, 1406, although Simon seems to place the prediction under the year 1412. Theodolle Teutonin, a medical man and astrologer of Berne who was "much appreciated by the four German leagues," also made a prediction from the revolution of the year 1412.[8] Guillaume Bellemain of Toulouse

[3] These groups of conclusions for the four quarters occupy respectively fols. 23r-24r, 25v-27r, 28r-29r, and 30r-31r. The intervening pages are occupied by six astrological diagrams which have not been filled in.

[4] *Recueil* (1929), p. 246.

[5] *Recueil* (1929), p. 243.

[6] *Ibid.*, p. 244, "le frere du roy," which according to Simon's dating would apply to Charles VI and Louis of Orléans. The expedition of Louis of Anjou was in 1382-1384.

[7] *Ibid.*, p. 245. For the eclipse see Th. v. Oppolzer, *Canon der Finsternisse*, Vienna, 1887, p. 250.

[8] *Recueil* (1929), p. 246.

did the same for the year 1413, forecasting the revolt of the Cabochiens therefrom.[9]

We have already heard the same Simon de Phares mention a Peter of Monte Alcino as author of a prediction from the comet of 1402. He further states that Peter, besides other astrological treatises, composed a general *Summa* on all parts of the art and that he predicted the great floods in Frisia, Holland, and Zeeland. He lived long and began to prognosticate young, so that his astrological career was an extensive one.[10] We have now to note some annual predictions by this Peter which Simon de Phares did not specifically mention. In 1418 Peter, who speaks of himself as the son of Bernard of Monte Alcino (now Montalcino), was led by fear of the Lord and desire to know the future to attempt an astrological forecast of that year.[11] It was not the only year for which Peter made such predictions, and his subsequent similar judgments for 1419, 1421, 1430, and 1448 are preserved for us in a manuscript at Oxford. In that for 1419[12] he argues from the analogy of the feudal hierarchy to the control of inferiors by superiors. He deems those ignorant of philosophy who condemn astrology and fail to perceive the natural order established by the Creator, to which future contingent events are subordinated not of necessity but by inclination. Peter then opens his judgment by imploring divine aid. In the first chapter he gives the disposition of the sky for the coming year for the meridian of Pavia. On March 26th there will be a minor eclipse of the sun for two and a half points of its diameter lasting an hour and a half before noon but not visible except to a trained astronomer. In the second chapter Peter gives eight conclusions as to the weather (*in dispositione temporali*); in the third chapter, eight conclusions concerning fertility and sterility; in the fourth chapter, five conclusions as to health and sickness for the coming year. Chapter five contains twelve conclusions of a general character about nobles and populace, war and peace, while the sixth and last chapter consists of particular predictions for the church, empire, France, and various sections and cities of Italy. Because the moon is in the house of Mars at the beginning of the revolution of the year, Peter predicts pestilence and great mortality among the serfs and lower classes, who are signified by the moon.[13]

[9] *Ibid.*, p. 247.

[10] *Ibid.*, pp. 218-219.

[11] Vatican Barberini 343, fols. 51-54, Petri de Monte Alcino. In the proemium he says: "et ideo ego Petrus quondam Bernardi de Monte Alcino timore domini ductus cupiens aliqua futura docere in anno 1418 quae debent secundum naturam corporum supercoelestium evenire."

[12] BL Ashmole 357, mid 15th century, fols. 179r-184v, opening: "Philosophorum doctissimus Aristoteles cupiens de moribus et civili scientia tradere doctrinam in ethicis. . . ."

Of Peter's judgment for the year 1421, two versions are preserved, one in the manuscript at Oxford in the Ashmole collection already mentioned,[14] the other at the Vatican in a codex which once was in the library of the elector of the Palatinate.[15] In the former manuscript, as in the prediction for 1419, Peter opens with some religious remarks, probably intended to demonstrate his orthodoxy and to dull the edge of any theological opposition to astrologers. He speaks of the greatness of God and the subordination of celestial hierarchies to Him. The judgment is then divided into the same six chapters as that of 1419, except that the subjects of the third and fourth are interchanged, and that the number of conclusions in each chapter is different. The Palatine manuscript, on the other hand, omits the pious introduction and welds the first two chapters into one with the title of the first but the subject matter of the second on the coming weather for the four seasons of the year.[16] The judgment is dated on the twelfth of March in the city of Pavia, like that of 1419. Peter states that concerning his most serene lord and concerning Genoa he has decided to make no prediction for reasons given elsewhere. But he advises the pope to take medicine until June 12 or thereabouts against an illness that threatens him.

[13] Ashmole 357, fol. 181r, "Pestilencia et mortalitas erit magna in plebe et maxime in servis et parvis personis significatis per lunam. Hec conclusio firmatur a luna in domo martis in principio revolutionis."

[14] Ashmole 357, fols. 185-191, opening, "Si animadverto viri hoc nostrum iudicium inspecturi. . . ."

[15] Vatic. Palat. 1438, fols. 91r-94r, "Incipit iudicium magistri Petri quondam Bernardi de Monte Alcino anno domini M°CCCC°XX°I die XII Martii post meridiem in civitate Papiensi."

[16] It has, indeed, only four chapter headings, the fourth covering the text of the fifth and sixth in the other MS.

Prelates, doctors of law, and all persons under the planet Jupiter will enjoy a prosperous year and be cherished and honored by their friends, yet, continues Peter rather abruptly, not to say inconsistently, some will be hanged and others make no money. Physicians and surgeons in general will prosper but will engage in quarrels which will hurt their reputation. Political predictions for the emperor, France, Paris, the kingdom of Apulia, Rome, Florence, and Venice, conclude with Perugia, where "many will be hanged and beheaded, and probably many nobles will die by steel, since the stars show that there will be a great stir there."

The judgment for the year 1430[17] has especial reference to Siena, where Peter presumably composes it, and for which he reckons the time of the sun's entry into the first degree of Aries as on March eleventh, in the seventh hour which is that of the moon, 27 minutes, 20 seconds, and 48 thirds[18] which would seem to be the equivalent of four-fifths of a second. Peace and joy are predicted for Siena, but the year will be an unfortunate one for the king of Castile, with many quarrels and wars in his kingdom and the defection of many of his barons.[19]

Peter was perhaps wise to select a new city occasionally for the seat of his annual prediction. His name appears in the records of the university of Pavia as teaching the practice of medicine and astrology from 1418 to 1427 with a salary reaching 882 florins, but in 1428 he is mentioned as absent, and his name appears again only in the year 1446. He seems to have lived until 1448, since a judgment for that year with a prologue in his style and in the same hand as two of his previous predictions, follows in the same manuscript.[20] The author's name, however, is

[17] Ashmole 357, fols. 192-205v, opening, "Quamquam id de quo paulo post dicturus sum vulgo incredibile atque novum quoddam esse videtur. . . ." The writing is now in a different hand from the preceding folios.

[18] Ashmole 357, fol. 192v, "Anno igitur millesimo quadringentesimo tricesimo non completo die xi Marcii hora vii que est hora lune minutis xxvii secundis xx tertiis xlviii diebus equatis ad meridianum civitatis Senarum ingredietur sol primum minutum arietis gradu xvii libra ascendente super orizonte. . ."

[19] Ashmole 357, fol. 202v, "Rex castelle anno futuro erit infortunatus satis et erunt in regno suo rixe et guerre multe et multi ex suis baronibus recedent ab ipso."

[20] Ashmole 357, fols. 206r-216, opening, "Mundi parens primus dum sublunaria . . ."

not stated. In this judgment the year is divided into quarters, and the significance of each planet is given for each of the four seasons.

In the same manuscript from the dispersed library of the elector of the Rhenish Palatinate, from which we have taken Henry Andrea's prediction for 1405 and that of Peter of Monte Alcino for 1421, are other astrological items for the years between 1405 and 1435. In one attention is called to "three great and horrible conjunctions"[21] of the three superior planets in 1425, all in Scorpio—Saturn and Jupiter on August 30,[22] Saturn and Mars on October 14, and Jupiter and Mars on October 22. The writer inclines to connect these conjunctions with the Hussites. There are two brief predictions for 1430, one by "a certain solemn doctor of Siena to an apostolic lord,"[23] the other by an otherwise undesignated "doctor."[24] There is also a discussion, written in 1430, of the movements of Jupiter and Venus during that year, 1431, and 1432.[25] Its author begins by lamenting the excessive number of pseudo prophets of both sexes and also of pseudo or incompetent astrologers. Some of the latter mistook the recent appearance of Jupiter and Venus in conjunction before Lent for comets. Others connected them with the Hussites. Our author who has no objection to astrology in the hands of properly trained persons points out that the conjunction was of benevolent planets in Aries, a good sign, and signified nothing evil. He states that they will be in conjunction again in May, 1431, and that in 1432 they will be twenty-eight degrees distant from the sun. Dated from Erfurt, Hertford, or Hereford in December, 1431, is a pronouncement by master Jerome Aleph[26] and other philosophers in the course of which they inform us that in September,

[21] Vatic. Palat. 1438, fol. 98r-v, opening, "Notandum quod anno domini 1425 erunt tres magne et horribiles coniunctiones. . . ."

[22] These figures are blurred in the MS and uncertain.

[23] *Ibid.*, fol. 99r, "Quidam solempnis doctor de Senis hoc scripsit domino apostolico que fierent in anno 1430. Principium veris erit siccum et frigidum. . . ."

[24] *Ibid.*, fol. 90v.

[25] *Ibid.*, fols. 88r-90r, opening, "Quoniam prohdolor multi pseudo prophete sexus utriusque nunc et hactenus pullulaverunt. . . ."

[26] Or perhaps Aloph.

1432, all the planets will meet in the tail of the dragon.[27] It seems similar to a prognostication for 1472 by a Jeronimus Herfordie to which we shall come in a later chapter. Perhaps MCCCCXXXII has been miscopied MCCCCLXXII or vice versa. Later in the same manuscript there is a German translation of the same letter.[28] Meanwhile it is immediately followed by a judgment for 1431, which closes with citation of John of Legnano's treatise on the significance of the comet (of 1368) "in his time when he was ordinary professor of law at Bologna."[29] Thus we have evidence that not only did new astrological treatises and predictions keep multiplying, but that those of sixty years since were not forgotten but still studied.

Such astrological activities and annual predictions were not confined at this time to Italians and Germans. In another manuscript at Oxford are preserved judgments for 1420 and 1421[30] by John de Rubeis, formerly physician to John, duke of Burgundy, who had been slain as he knelt before the dauphin in 1419. Although Simon de Phares mentions a number of other physicians and astrologers who were associated with the house of Burgundy, he does not seem to have known of this John de Rubeis. Henry Seldem or Selden or Selder, who made a new and more precise verification of the positions of the fixed stars in 1430, had predicted, if we believe Phares, the siege of Rouen by Henry V from the revolution of the year 1419 and the assassination of the duke of Burgundy at Montereau.[31] John de

[27] *Ibid.*, fol. 99v, "Pro novitatibus anno 1431. Universis ad quos presentes perveniunt magister Ieronimus Aleph minimus philosophorum. . . ."

[28] *Ibid.*, fol. 104r.

[29] *Ibid.*, fols. 100r-103v, ending, ". . . tempore suo ipso ordinario in facultate iuridica Bononie tunc existente."

[30] Hertford College 4, 15th century, fols. 172r-183v, and 184r-191r respectively: opening, "Cum scientia astronomie sit altissima contingentia futura . . ." and "Scientia astrologie multum utilum (*sic*) est ad perfectionem nostri intellectus et ad evitandum futura pericula. . . ." It will be seen that the old notice of the MS, when it was Aula B. Mariae Magd. 2, fols. 160-181v, in Coxe's Catalogue, requires correction at several points.

[31] *Recueil* (1929), p. 250. I cannot find any connection between him and the seventeenth century John Selden. But he is possibly the same as a Henry Salder whose canons on the Alfonsine Tables are preserved in a MS at Erfurt. Since, however, it was copied at Paris in 1377, Simon de Phares would appear to be mistaken as to Henry's date. Amplon.F.37, fols. 64-114: "Explicit canones Heinrici Salder scripti per me Kristianum de Hag presbyterum et monachum monasterii s. Petri Salczburge a.d. 1377 19a die mensis Decembris Parisius." Perhaps Simon changed 1340 to 1430. See Zinner 9599-9609.

Tannstetter in the 1514 edition of Tables by Peurbach and Regiomontanus mentions among their successors at the university of Vienna or perhaps in Germany at large a Henry Seldner: *Tabulae eclypsium magistri Georgii Peurbachii* . . . , Vienna, 1514, fol. aa 5 recto.

Rubeis concludes his second judgment for 1421 at Bruges on the last day of December, 1420.[32] He has the same custom as Peter de Monte Alcino of opening and closing his predictions devoutly. He begins that for 1420 by asking divine direction in his forecast. Like Peter he begins the year on March eleventh but is less precise as to the hour.[33] He divides his prediction for either year into three parts; introduction,[34] general conclusions, and particular conclusions. For 1420 there are 28 universal conclusions and twelve particular ones; for 1421, 29 general conclusions and eleven particular ones. In our manuscript, however, the prediction for 1420 seems to terminate with the tenth particular conclusion concerning the Genoese, after having considered papacy, empire, France, England, Portugal, the "kingdom of Apulia" (or as we should say, of Naples), Milan, Venice, and Florence in the preceding nine. The same states are the subject of predictions in the judgment for 1421, except that France is omitted and Portugal is replaced by Lucca, while the tenth conclusion treats of Bruges, where John de Rubeis writes, and the eleventh and last "of the most noble city of Rome in which the supreme pontiff resides." It will be seen that the Italian states appear almost as prominently as if the judgment had been made in Italy, but it is perhaps doubtful whether this is due to ultramontane astrologers following Italian models in astrological predictions, or to actual importance of the Italian cities and principalities in the international intelli-

[32] Hertford College 4, fol. 191r, "actum brugis in flandria anno christi 1420 die ultima decembris et sufficiant ita licet plura alia possent scribi. Que omnia subiciuntur dispositioni regnantis in secula seculorum. Amen."

[33] Hertford College 4, fol. 172r, "undecima die martii ante meridiem vel illo die post meridiem in die lune."

[34] "Prima pars est prohemialis cum aliquibus premissis et positionibus." In the judgment for 1420 it occupies fols. 172r-175r, the general conclusions 175r-181r, and the particular conclusions 181r-183v.

gence of the time. In the Judgment for 1420 John represents the king of France as in great danger of his body by reason of infirmity in that year and warns his physicians trained in the science of astronomy to be forewarned. "The king of England" also "will be in danger and is likely to die within three years. Nevertheless by good provision by skilled persons he can save himself, as I have said in the Judgment for the past year," i.e. 1419, which is not contained in our manuscript. "And if he takes the daughter of the king of France to wife, for the future proceeding in a legal manner, he will have escaped the said dangers in part but not entirely."[35] In the Judgment for 1421 John de Rubeis practically reiterated this prediction for the king of England, and it would have been fulfilled by the death of Henry V in 1422, if John again persisted in it.

It was at Bruges also that another physician, bearing the British name, Thomas Broun, made in the year 1425 an astrological judgment based upon the great conjunction of Jupiter and Saturn on the last day of August in the twelfth degree of Scorpion. It is preserved for us in yet a third manuscript at Oxford.[36] Ten years later this same Thomas Brown, if we may so modernize his surname, commented in a brief tract preserved in the same manuscript, upon the constellation which prevailed on Wednesday, September 21, 1435, at the nineteenth hour and forty minutes,[37] at which time peace was made between king Charles VII of France and Philip, duke of Burgundy, at the city of Arras. This is a more precise dating of the treaty of Arras than contemporary chroniclers or copies of

[35] Hertford College 4, fol. 182v, ". . . rex anglie erit in periculo et dubium est de morte infra 3 annos. Rex tamen bona provisione a peritis potest se iuvare ut narravi in iudicio anni preteriti. Et si capiat filiam regis francie in uxorem in posterum legaliter procedendo ab una parte dictorum periculorum erit evasus sed non ex toto."

[36] Digby 194, 15th century, paper, fols. 96v-98r, "Explicit iudicium coniunctionis magne Saturni et Iovis ultimo die Augusti in Scorpionis 12° gradu quem collegit T. Broun phisicus Menevensis dioc. anno Christi 1425 in opido de Brugis."

[37] Digby 194, fol. 95v-96r. The tract opens without title, "Anno Christi 1435 mense septembri die 21 hora 19 minuto 40 die mercurii et hora lune facta est pax inter regem Karolum et ducem Burgundie in civitate Atrabati cuius hore constellatio talis erat. . . ." Macray, in his catalogue of the Digby manuscripts, has given the number of minutes as four rather than forty, and possibly we should read "4°" rather than "40."

the peace itself give. While Thomas Broun's extant astrological writings are thus associated with the Burgundian dynasty or territory, he is described in the later treatise as a native "of the city of Merlin," i.e. Caermarthen, a fact which probably gave an added appeal to his efforts as a diviner.[38] Like John de Rubeis he is overlooked in Simon de Phares' catalogue of past astrologers.

Broun's predictions also are more favorable to England than to France. He feels that the conjunction of 1425, like that of Saturn and Mars in Cancer in 1415, threatens France with great and destructive wars and possible overthrow or transfer of its government. And he interprets the constellation prevailing at the time of the signing of the treaty of Arras as unfavorable.

Another feature of Broun's astrology is to turn back to similar previous conjunctions for light on the interpretation of present ones, "since exhibition of the past gives assurance for the future." He therefore reviews not only the conjunction of 1415 just mentioned, but also, in connection with a conjunction of the three superior planets in 1425 which happens only every forty years, alludes to its previous occurrence in 1345 and 1385. On both those occasions he asserts that it was followed by terrible events, but the fact that he adduces the popular disturbances in England and Flanders in 1380-1382 as evidence of this shows what loose proofs would satisfy the astrologically-minded. Usually astrologers held that the effects of conjunctions were not fully realized until some years after the event, but Broun groups these happenings of preceding years with others in 1385 itself as to be associated with the triple conjunction of that year. He also harks back for purposes of comparison to the conjunction of Saturn and Mars in Cancer in 1357, and cites the letter of John de Murs to Clement VI.[39] He says that men were recalling it when he was in Paris in 1391.[40]

[38] Digby 194, fols. 95v-96v, "collectus per Thomam Broun urbis Merlini."

[39] Digby 194, fol. 95v, "Item Iohannes de Muris in epistola ad Clementum papam sextum dicit quod veraciter est (fol. 96r) compertum quod Saturnus in Anglia, Iupiter in Francia, et Mars in Alemannia dominantur."

[40] *Ibid.*, fol. 97r, "tempore meo quo studui Parisius scilicet anno Christi 1391 . . ."

This was during our author's student days and, although the dates do not quite agree, seems to indicate that he is the same person as the Thomas Broun who presented himself for the baccalaureate in medicine at Paris on February 19, 1396, with a certificate that he had studied medicine at Oxford for six years and a half.[41] His certificate was signed by John Rampton (Hampton?), an apostolic notary of the diocese of Winchester.

In 1426 A.D. John Holbrooke, a master at St. Peter's college, Cambridge, from 1418 to 1431, gave the college library a treatise, written partly in his own hand, on *The Art of Finding the Figure for the Conception of the Person Born.*[42] And in a manuscript of German provenance which is now preserved at Copenhagen, at the close of a copy of Arnald of Villanova's *De egrotantibus partibus omnium membrorum a capite usque ad pedes,* which master John of Babinhus made in 1420 on paper, there is attached upon a sheet of parchment a horoscope for his son Eberhard born in 1421 on the Tuesday following Epiphany before noon between the ninth and tenth hour.[43] Stefan von Stinendia made an annual prediction for 1422.[43a]

For 1427 there is extant a judgment of the revolution of the year by the surgeon, Leonard of Bertipaglia, who here seems to follow especially the manner and method of the Arabic astrologer, Haly, in his work on the revolutions of years.[44]

Simon de Phares tells us that Jehan Marende based a prediction upon a conjunction of the three superior planets, presumably in 1425.[45] When Martin of Lausanne saw three suns in the

[41] E. Wickersheimer, "Les médecins de la nation anglaise (ou allemande) de l'université de Paris aux XIVe et XVe siècles," Extrait du *Bulletin de la Société française d'histoire de la Médecine,* Paris (1913), p. 26, citing *Commentarii facultatis medicinae Parisiensis* (1395-1532), I, fol. 7v (in MS 547, Bibliothèque de la Faculté de médecine de Paris).

[42] BM Egerton 889, Ars inveniendi figuram conceptionis nati.

[43] Copenhagen Gl.kgl.S.1655, quarto chart., fols. 1-106v, "Explicit Arnoldina de egrotantibus partibus a capite usque ad pedes finita per manus magistri Iohannis de Babinhus anno Domini 1420 in vigilia sancti Anthonii abbatis Erfordie."

[43a] Zinner 10631.

[44] For a fuller account of Leonard's prediction, which is found in S. Marco VII.LI, fols. 123r-125, see my *Science and Thought in the Fifteenth Century* (1929), pp. 61-62 and 80.

[45] *Recueil* (1929), p. 249.

sky in 1434, he predicted the approach of some great disaster, but his prognostication was not fulfilled until the fall of Constantinople in 1453.[46] Peter of Saint Vallerian, a canon of Paris, predicted from the revolution of the year 1435.[47]

The history of France and England is closely related to astrology in a manuscript at Paris[48] from which we have already taken materials. What we have now to note is a series of nativities for important personages in both lands: duke John of Burgundy, whose stay in the womb is calculated as 284 days, eleven hours, and 32 minutes, Anthony of Burgundy, John, count of Alençon, Charles VI of France, Henry VI of England, the duke of Brittany, John Falstaff, and the count de Montfort. Not content with reckoning the duke of Burgundy's nativity in 1371, our manuscript further provides annual revolutions for him of 1405, 1406, 1407, 1408, 1416, and 1426, while there are special astrological charts for the coronation of Charles VII, called *regis Karoli moderni,* in 1429, and that of Henry VI in 1431 at Paris. The relation of past conjunctions of Saturn with Jupiter to the history of the French ruling house is traced back not only to that of 1325 which was soon followed by the death of Charles IV and accession of the house of Valois, but to January 31, 988, when Saturn and Jupiter changed their *triplicitas,* and Capetian rule began with Hugh, count of Paris. Charles Jourdain,[49] following Vallet de Viriville,[50] asserted that this collection of astrological charts and predictions was prepared for the most part in 1426 at the request of the English government, chiefly by Jean Halbout de Troyes, but there seems to be scant support for these assertions in the manuscript itself which is written in Latin and French, is interested in French rather than English history, comes down as late as 1478, and lays no especial stress on the year 1426.[51]

[46] *Ibid.,* p. 251.

[47] *Ibid.,* p. 253.

[48] BN 7443, fols. 57-90—of these fols. 57-60 are misplaced between fol. 62 and fol. 63—and fols. 117-130.

[49] Chas. Jourdain, *Excursions historiques,* 1888, p. 584, note 1.

[50] Vallet de Viriville, *Histoire de Charles VII,* II, 345.

[51] It figures only in the later fols. 117-130 mentioned in note 48.

Although the tract in question is not itself an astrological prediction, this is perhaps the best place to take notice of an astrological discussion which gives the present year as 1409, in which the author reproves those who operate on the assumption that the moon at the hour of birth is in the ascendent of the time of conception. This, he contends, is rarely the case. On the other hand, he holds that the place of the moon at conception always becomes the ascendent of the nativity.[52] This should have been a very convenient assumption for astrologers.

[52] BN 7280, fols. 61r-73v, opening, "Consideratis omnibus regulis michi notis . . ." The present year is mentioned at fol. 72r, "prima martis presentis anni 1409. . . ."

CHAPTER XLII

PIERRE D'AILLY: CARDINAL AND DEFENDER OF ASTROLOGY

In this and the ensuing chapter we come to two men, Pierre d'Ailly and Jean Gerson, who continue the trend of thought which we observed in the second half of the previous century in Nicolas Oresme and Henry of Hesse. Not that their views are identical with those of their predecessors; one of them indeed is often in direct opposition. But, like the other two, they were both at the university of Paris. There seems furthermore in either case to have been a relationship of master and disciple between the two, although in the matters with which we are here principally concerned Henry of Hesse adhered more closely to the position and ideas of Oresme than did Gerson to those of d'Ailly.

Cardinal Pierre d'Ailly (c.1350-c.1420), despite many other preoccupations, such as the conciliar movement and church reform, took a great interest in the subject of astrology and has left many treatises on that theme.[1] Not all of these are included in the editions of d'Ailly's works to which I have had access.[2]

[1] These will be found listed by Paul Tschackert, *Peter von Ailli*, Gotha, 1877, pp. 358-359; and by L. Salembier, *Petrus de Alliaco*, 1886, xlix, 392 pp. (a dissertation in Latin), pp. xxiii-xxv, who mentions MSS and incipits. At pp. 177-194, Salembier discusses d'Ailly's attitude to astrology somewhat apologetically. A biography of d'Ailly in French which Salembier left unfinished in 1913 was published in 1932.

[2] I have chiefly used and shall cite in the following notes an incunabulum edition of about 1480, numbered IB 49230 in the British Museum. It contains by Petrus de Alliaco, de Ymagine mundi, Epilogus mappe mundi, de legibus et sectis contra superstitiosos astronomos, de correctione kalendarii, de vero ciclo lunari, Cosmographiae tractatus duo, Vigintiloquium de concordantia astronomice veritatis cum theologia, de concordia astronomice veritatis et narrationis hystorice, Elucidarius astronomice concordie cum theologia et cum hystorica narratione, Apologetica defensio astronomice veritatis, Alia secunda apologetica defensio eiusdem, de concordantia discordantium astronomorum. Then follow several works by Gerson, of which more later. MSS containing somewhat similar collections of

D'Ailly justified his attention to astrology in a passage in the closing chapter of his *Elucidarius:* "We know that some have objected to us that our calling and likewise our time of life would more fittingly be occupied with theological than with these mathematical studies." But he points out that he has done his part in composing theological treatises anent the schism and the questions of church union and reform. He argues that mathematical studies are useful to theology, if prosecuted without vain curiosity or ostentation. "Nor do we deem it fitting or useful for Christian polity that a professor of theological science be utterly ignorant of those things which have been written in these treatises" (i.e., the *Elucidarius* and his seven other treatises of the year 1414 on astrological and mathematical topics). To show that there is no necessary conflict between astrology and theology, and to emphasize the agreement between astrology and history, may be regarded as the two chief aims of the treatises by d'Ailly which we have to consider.

We should not, however, forget other writings by him in the fields of geography, meteorology, and calendar reform which were freer from any connection with occult science. There was the *Imago mundi,* completed on August 12, 1410, which was so closely read and annotated by Columbus. There was the commentary on the books of Aristotle on meteorology,[3] although it was merely an abbreviated paraphrase of that work. There were his letters to John XXIII and exhortation to a general council on correction of the calendar and his treatise on the true lunar cycle with tables. These were not works of much originality but they helped keep the lamp of science burning at Paris in the dark days of Burgundian and Armagnac. He also wrote logical and psychological treatises.[4]

D'Ailly shows a broad acquaintance with previous medieval

his works are Cambrai 927 (826), 929 (828), 954 (852), University of Cracow 575, all of the 15th century. See also Zinner 341-422.

[3] MSS are CLM 26929, fols. 264-275, and 27105, fols. 1-34, both of the 15th century, opening, "Propter nostrum admirari inventum est philosophari. . . ." Printed at Strasburg, 1504: Proctor 9972.

[4] See Salembier, pp. xxi-xxii, for a list of them.

writers on the subjects of astronomy and astrology. In his works on calendar reform he cites various medieval computists and such fourteenth century astronomers as John de Lineriis and John de Murs.[5] He very frequently utilizes the works of Roger Bacon and Albertus Magnus, also those of Henry Bate, whom he twice calls a disciple of Albertus Magnus,[6] and of Abraham ibn Ezra. He quotes from such a theological writer on astrology as William of Auvergne, bishop of Paris, from Leopold of Austria, the author of an astrological collection,[7] and from Vincent of Beauvais, the encyclopedist.[8] He also cites the various Arabic writers and such recent opponents of astrology as Nicolas Oresme and Henry of Hesse. He does not, however, seem to be familiar with all the treatises which the two last-named authors wrote on or against magic, astrology, and other occult sciences. D'Ailly represents himself as adopting a middle course[9] in his attitude toward astrology, on the one hand rejecting the attacks of Oresme and Henry of Hesse upon it,[10] and on the other hand opposing the extreme contentions of superstitious astronomers.[11] He also rejects some of the astrological doctrines maintained by Roger Bacon, and is more inclined to agree with Albertus Magnus, especially in the *Speculum astronomiae,* which d'Ailly ascribed to him, and with William of Auvergne. He agrees with the *Speculum* that false astrologers have diffamed the true science of astronomy by infringing upon freedom of the will and mixing in with astronomical works several execrable superstitions

[5] Also cited in the *Elucidarius,* cap. 37.

[6] *Elucidarius,* cap. 1, "Henricus de Machlinia magnus Alberti discipulus supra librum magnarum coniunctionum Albumasar differentia prima ita scribit." He uses the same expression concerning Bate in the *De concordantia discordantium astronomorum.*

[7] *Vigintiloquium,* Verbum 15, "Leupoldus qui aliorum astronomorum sententias compendiose recolligit."

[8] *Ibid.,* Verbum 11.

[9] At the beginning of the *Apologetica defensio astronomice veritatis* d'Ailly says, ". . . scripsi breviter in tractatu de legibus et sectis contra superstitiosis astronomos ubi medium tenere docui inter extremas duas opiniones."

[10] His *Apologetica defensio astronomice veritatis* replied to arguments of Henry of Hesse; his *Alia secunda apologetica defensio* was especially devoted to answering the work of Oresme dissuading kings from the practice of astrology.

[11] Directed especially against such is the *De legibus et sectis contra superstitiosos astronomos.*

of the magic arts.[12] And he praises Roger Bacon for having demonstrated in his letter to pope Clement[13] that the fact that some astrologers are superstitious does not invalidate the art.

The first treatise by d'Ailly which we shall consider is that *Concerning Laws and Sects against Superstitious Astronomers,* written on December 24, 1410.[14] In it he assails those astrologers who bring that liberal science into disrepute with Christians by subjecting the Christian religion to the laws of the stars. He states that William of Auvergne in his work *On the Faith and Laws,* had already overthrown this contention of the astrologers. In particular he criticizes a certain English doctor, in whom he evidently has Roger Bacon in mind, for renewing the theory that the Christian religion is under the planet Mercury. He grants that Roger Bacon seemed to bring forward this theory in order to confirm the Christian faith and praise the law of Christ, and that he affirmed the existence of free will. But d'Ailly is inclined to hold that such an astrological doctrine weakens rather than confirms the faith. In the place of the extreme theory of Bacon, who would subject all religions to the motion of the stars, d'Ailly suggests the following middle course: All laws and sects, so far as they are dependent upon nature, are subject to the stars. Such laws and sects as idolatry and Mohammedanism are especially so subject, since there is no miraculous or supernatural element in them, but only a human or diabolical factor, for which the planets should not be blamed. But religions of divine origin such as Judaism and Christianity are in no way subject to the laws of the stars. D'Ailly was not the first, however, to draw this distinction.

Such an event as Noah's flood Peter regards as natural and

[12] *Vigintiloquium,* Verbum 3, "Unde Albertus Magnus perutilem etiam tractatum edidit in quo vere astronomie et artis magice libros per eorum principia et fines distinxit ut astronomicam veritatem et magicam vanitatem ab invicem sequestraret."

[13] *Alia secunda apologetica defensio,* "Et hoc pulcre et diffuse probat Bacon in epistola ad papam clementem. . . ."—i.e. in either the *Opus Maius, Opus Minus,* or *Opus Tertium.*

[14] This date is given in the MSS as well as the printed edition: see Cambrai 927, fols. 67v-91v; Cambrai 954, fols. 49-62.

subject to the stars. Both in the work *On Laws and Sects,*[15] and in his later *Vigintiloquium,*[16] concerning the concord of astronomical with theological truth, he cites William of Auvergne that the biblical statement concerning the cataracts of the sky being opened referred to the aquatic signs of the zodiac. He states that it may be that Noah knew of the flood beforehand through prophetic revelation, nevertheless it seems probable that some constellation prefigured that event and was further a partial cause of it. D'Ailly thinks that it is as reasonable to hold that some constellation prefigured the flood as it is to regard the rainbow as a sign that there will never be another such deluge.[17] He once again alludes to the subject of the flood in the first chapter of his *Elucidarius* of the agreement of astronomical with theological and historical truth, where he refers to Henry Bate's researches into the date of the conjunction that signified the deluge, which Bate dated 3382 B.C.

While d'Ailly freed the Christian religion from the control of the stars, he did not so exclude the nativity of Christ. In the *Vigintiloquium* he says, "Without rash assertion but with humble reverence I say that, although the blessed incarnation and nativity of Christ was miraculous and supernatural in many respects, nevertheless nature too could co-operate in many ways with divine omnipotence in this divine work of conception and nativity, as a servant assisting its Lord and Creator, and could in these matters through the virtue of the heavens and stars co-operate with the natural virtue of His mother, the Virgin."[18] He

[15] Cap. 7.

[16] Verbum 5.

[17] *Ibid.,* "Et ideo licet Noe illud diluvium precognoverit per revelationem propheticam tamen probabile videtur quod aliqua constellatio astronomica illum effectum presignaverit et ipsius aliqualiter partialis causa fuerit. . . . Nec minus apparet probabile quod aliqua constellatio illud diluvium futurum presignaverit quam quod arcus celestis signum sit consimile diluvium non amplius esse venturum sicut in genesi scribitur."

[18] *Vigintiloquium,* verbum 5, ". . . sine temeraria assertione sed cum humili reverentia dico quod benedicta Christi incarnatio et nativitas, licet in multis fuerit miraculosa et supernaturalis, tamen etiam quo ad multa huic operi deifico conceptionis et nativitatis natura tam quam famula domino suo et creatori subserviens divine omnipotentie cooperari potuit et in his per celi et astrorum virtutem concurrere cum virtute naturali virginis matris eius."

had taken up the same position in the sixth chapter of the work *On Laws and Sects,* and he reiterates it in his *Apologetic Defense of Astronomical Truth* written at Cologne, the 26th of December, 1414. Here he states that some have endeavored to free the birth of the virgin Mary from the control of the stars. Henry of Hesse in particular in a certain sermon concerning the nativity of the blessed Mary, denied the influence of the planets in the hour of her nativity.[19] D'Ailly again reminds the reader that he has often assailed the superstitious astrologers, for example in his sermon before the king of France. But he contends that it is easier to say that the nativities of Jesus and Mary were free from the influence of the stars than it is to prove it, or to prove that the catholic faith is against the natural influence of the stars. The catholic faith does not compel one to say that the sun did not warm the Virgin and, consequently, it is not heretical to assert other physical influences of the heavenly bodies upon her. Later d'Ailly concludes by saying that just as Christ, speaking concerning the Mosaic Law, said, "I am not come to destroy, but to fulfill the law," so too he does not himself wish to destroy the law of nature.

And, therefore, I conclude that not only the blessed conception and nativity of Christ or of the blessed Virgin, his mother, but their entire mortal life, like the natural condition of other men, in so far as it was subject to natural laws, was subject not merely to the stars or heavenly bodies, but also to the celestial elements.

He explains that this excludes from astral control, of course, the operation of divinity and grace, and it is to be remembered that astronomers' judgments of nativities are difficult and uncertain, and that skilled astronomers readily admit this fact.

D'Ailly was much attracted by the astrological doctrine of con-

[19] Salembier, *op. cit.,* p. 183, asserts, "Henricus enim, in sermone de Nativitate B. Mariae, influxum siderum in hominum nativitatem uti superstitionem impugnare ausus fuerat." But I question if this is not too general a statement. At p. 182 Salembier mentions two MSS of this *Apologetica defensio astronomicae veritatis adversus opinionem Henrici de Hassia,* namely, Cambrai 828, fol. 89, and 852, fol. 116v. These MSS are now numbered 929 and 954.

junctions against which Henry of Hesse had directed one of his treatises. But d'Ailly affirms that "all astronomers are agreed in this that there never was one of those conjunctions without some great and notable change in this world."[20] Aristotle agrees in the book, *De natura et proprietatibus elementorum,* and Albertus Magnus in his exposition of the same. D'Ailly noted, in addition to the conjunction signifying the flood, another signifying the kingdom of Israel and law of Moses for which he followed the account of Abraham ibn Ezra.[21] He also remarked a conjunction in 808 marking the dominion of the Franks, especially of Charlemagne, and one in 1226 under which the Franciscan and Dominican orders began and the Tartar empire.[22] Indeed, in his work on the agreement of astrology and history he examined seven past conjunctions and associated most memorable events with them.[23]

A brief astrological treatise by d'Ailly which is not contained in the edition of 1480 but appears in a number of manuscripts[24] is that on the state of the constellations at the beginning of the world and the mean conjunctions which have followed. Perhaps a work on the figures of the sky is the same tract under another title.[25]

D'Ailly was especially interested in the coming of antichrist and the end of the world,[26] both of which he believed might be

[20] *Vigintiloquium,* Verbum 14, "Et in hoc concordant omnes astronomi quia numquam fuit aliqua istarum conjunctionum sine aliqua magna et notabili mutatione in hoc mundo."

[21] *Elucidarius,* cap. 30.

[22] *Ibid.,* cap. 11.

[23] *De concordia astronomicae veritatis et narrationis historicae.*

[24] "De figura inceptionis mundi et coniunctionibus mediis sequentibus:" Cambrai 929 (828), 15th century, fols. 97-105; Cambrai 954 (852), 15th century, fols. 123-128; Valenciennes 344 (331); Vienna 5266, item 6; Vienna 5318, item 7. Incipit, "Figura coeli que fuit ante Christum. . . ."

[25] Univ. of Cracow 575 (CC.I.30), 15th century, folio, paper, fols. 208-229, De figuris coeli. At fol. 219 is allusion to the conjunctions of 1345, 1385, and 1425. The work also occurs in MS 584 (DD.III.54), likewise of the 15th century.

[26] *Elucidarius,* cap. 34, "de adventu Antichristi et fine mundi conjectura prognosticatione." In the third part of his unpublished work on the persecutions of the church, written in 1418, he again treated astrologically of the time of the coming of antichrist and of the approaching destruction of Islam. See N. Valois, "Un ouvrage inédit de Pierre d'Ailly, le *De persecutionibus ecclesiae,*"

astrologically conjectured. Some thought that the age of the world could be inferred from that of man, the microcosm, and that there were four ages of the world corresponding to the four seasons of the year and the four ages of man. Three of the twelve signs of the zodiac rule each age. As man grows old through the influence of Saturn and Mars, so the world will hasten to its end by the agency of the same planets. Tschackert and Valois have both noticed d'Ailly's predictions of great changes for the year 1789.[27] He may be said to have forecast the Protestant revolt as well as the French revolution, since he predicted great change in the church within the next hundred years. Many of his conjectures were less happy, however, and of course such vague predictions of general change were being continually put forth at that time.

Some of Henry of Hesse's criticisms of astrology or astrologers d'Ailly accepts. He grants, for example, that the notion that the planet Saturn governs the first and eighth months of the process of the formation of the child in the womb is "vain and frivolous and contrary to the teaching of philosophy and medicine." To make a cold star like Saturn rule the first month when a warming influence is above all essential seems absurd, and probably throughout the process or at least for the first four months the sun has more to do with the formation of the child than any other planet. Nevertheless d'Ailly still holds that astronomers have ascribed the months each to a ruling planet in a certain order of the planets because of some special occult virtue which the Creator has implanted in them, and he accepts the doctrine that each of the planets in turn rules an hour of the day.[28]

D'Ailly occasionally makes other criticisms of the details of astrological technique. Thus he finds Albumasar, and Albertus

Bibliothèque de l'école des chartes, 65 (1904), 557-574. The work occurs in MS Bibl. de Marseille 1156, 15th century, fols. 1-8 and 11-30. Valois prints excerpts from the Latin text.

[27] This prediction, first made in his *De concordia astronomice veritatis et narrationis historice* (or, *Concordantia astronomiae cum historica narratione*) in 1414, he reproduced in his *De persecutionibus ecclesiae* of 1418.

[28] The discussion summarized in this paragraph occurs in the *Apologetica defensio astronomice veritatis.*

Magnus in the *Speculum astronomiae,* in error in placing the birth of Christ in the sign of Virgo when it should be in Libra.[29] Similarly he criticizes Roger Bacon for locating the conjunction which he believed signified the coming of Christianity in the sign of Taurus when it should have been in Cancer.[30] He further criticizes Bacon for following in this matter the work *De vetula* which was ascribed to Ovid, but which d'Ailly points out was really written long after Christ and in adulation of the Faith was attributed to Ovid to give the impression that the coming of Christianity had been foreseen by him. "But," declares d'Ailly, "our most true religion needs no false adulation."[31] D'Ailly, moreover, had occasion to correct himself as well as others in the matter of astrological accuracy. In the introduction to his *Elucidarius* he notes that in his *Vigintiloquium* and his treatise on the concord of astronomical truth and historical narrative he had followed certain writers in dating a greatest conjunction of Saturn and Jupiter in the head of Aries about two years before the deluge. Afterwards further reading of astronomical works convinced him that this dating and that of other conjunctions before and after the flood was many years off. Hence he has composed this third treatise to supplement the two preceding.

D'Ailly opens his *Second Apologetic Defense of Astrology,* dated October 3, 1414, at Cologne, with these words:

> Often and much have I argued this question with myself, why great doctors of theology, even those most skilled in mathematical sciences, who have praised astrology concerning the motions of the heavenly bodies, nevertheless have condemned extremely astronomy dealing with judgments.[32]

[29] *Elucidarius,* cap. 2.

[30] *De legibus et sectis,* cap. 4; *Elucidarius,* cap. 14.

[31] *De legibus et sectis,* cap. 4: "Sed de hac auctoritate modicum curandum est quia bene consideranti perspicuum est librum illum non ab Ovidio sed ab alio longe post adventum Christi fuisse conscriptum et in adulatione fidei quasi lex Christi ab Ovidio fuisset previsa eidem esse attributum. Lex autem nostra verissima non eget falsa et adulatoria laude."

[32] "Sepe et multum hoc mecum cogitavi cur magni doctores theologi etiam in scientiis mathematicis peritissimi qui astrologiam de motibus celestium corporum laudaverunt astronomiam de iudiciis nihilominus extreme condemnaverunt."

The use of the word astrology where we should employ astronomy and vice versa will be noted. Nicolas Oresme is the opponent of astrology whom d'Ailly now has particularly in mind, and of his treatises that in which he tries to dissuade princes from their curiosity concerning astrology and other occult arts. D'Ailly has no objection to the rebuke to idle royal curiosity and to vain arts of inquiring concerning things secret or future,[33] but he complains that Oresme then proceeds to an attack on astrology itself. After listing Oresme's arguments against that art, d'Ailly adds,

> From which that doctor finally concludes that, while diversity of physical constitutions may be to some extent from the sky, which inclines the souls of men to various characters without however compelling them, nevertheless astrologers cannot foreknow this.[34]

Cardinal d'Ailly then answers these arguments, his main rejoinder being that the ancient philosophers must have had reasons for assigning various properties to the different planets, signs, and parts of the zodiac, and did not invent these. If it is objected that they could not have learned all this in the comparatively brief time elapsed since the deluge, he wishes to know in return how they were able to learn all about medicinal simples, with their varying degrees and occult properties, within the same time. And it may be that some things were disclosed by revelation and not merely by reason and experience, since we hear that Abraham had great astronomical knowledge.

Perhaps the latest utterance of d'Ailly on astrology and its relations to theology that has reached us is a letter to Gerson who had sent him a copy of his *Trilogium*[35] *astrologie theologisate* which was composed in 1419. D'Ailly's letter of acknowl-

[33] "In quo utiliter suadet quod reges aut principes noxia curiositate solliciti non nitantur vanis artibus occulta perquirere et investigare futura quod fieri solet per astronomie iudicia."

[34] "Ex quibus finaliter concludit ille doctor quod licet complexionum diversitas sit aliqualiter a celo que animos hominum ad varios mores sine tamen necessitate inclinat. Tamen hoc astrologi nequeunt prescire."

[35] In the MS, however, the word is spelled "Tricelogium" both in d'Ailly's letter and the title of Gerson's work: see BN 2692, fols. 145r, 148r.

edgment and reply is entitled in the manuscript where I have examined it, *An Apologetic Defense of Astronomy*.[36] He first reiterates Gerson's twelve points or considerations which should limit and restrain the field of astrological judgments. These are: divine freedom in acting, freedom in executing of angels good or bad under God's permission, only a general influence of the heavenly bodies, the incomprehensible variety of the constellations, the diversity of radiation attributable to the mediums through which the rays pass, a particular diversity in beginning things attributable to their different inferior seeds and roots, human liberty which conjoined with necessary causes gives rise to contingent effects, legal and prophetic severity prohibiting such judgments, the lack of truly trained astronomers, exemption of the mysteries of salvation from any astral influence, supernatural prevision and ordination of men, almost daily miracles for the elect. D'Ailly is ready to accept these theological restrictions upon the natural action of the stars and the judgments of astrology, provided only Gerson is moderate in interpreting and enforcing them. He refers to his own *On laws and sects against superstitious astronomers* to show that he has long since taken up a similar position. But if, which God forbid, Gerson's intention is to reduce "astronomy" to impotency by a show of theological authority, d'Ailly is entirely opposed to this. As he called superstitious those astronomers who carried the pretensions of their art to a point contrary to theological truth, so he would call superstitious those theologians who would reduce astronomy to a state contrary to physical reason or destroy it utterly. He prefers a middle course, towards which he suggests three conclusions. First, that all religions for those elements in them that are natural are somewhat subordinated to the force of the constellations. Second, that religions of human or diabolical

[36] BN 2692, fols. 145r-147v, "Apologia defensiva astronomie a Reverendissimo patre Cardinali Cameracensi ad magistrum Iohannem Cancellarium parisiensem" (in the margin is added, "de gersonno"). The text opens, "Tricelogium astrologie theologisate a vobis frater carissime sic intitulatum michique transmissum libenter accepi. In quo sub 30 propositionibus fundatis in 12 radicibus theologicis astronomicorum iudiciorum curiositatem arcere conamini."

origin are decidedly amenable to astrological prediction. Third, that true divine religions like Christianity and, formerly, the Mosaic law, are not under the constellations for their supernatural, divine, and miraculous elements.

Cardinal d'Ailly likes to think of astrology as natural theology and believes that God established theology and astrology in harmony by eternal law. He grants that men do not understand all the combinations and positions of the stars. But do they understand all the mysteries of theology or problems of natural science? Why should astrological judgments alone be spurned because of the difficulties involved? He also grants that many superstitious persons such as nigromancers and magicians pretend to be astronomers, but he contends that astrology is not to blame for this, any more than theology is responsible for the pseudo-theologians and heretics such as abounded at the council of Constance. He closes with an appeal to Gerson to maintain in agreement with himself the same position as to the actions of the celestial bodies and fate as St. Thomas Aquinas upheld in the first part of his *Summa* and as Albertus Magnus outlined in the *Speculum astronomiae*.[37] Thus d'Ailly maintained essentially the same position as we have seen him take up in his other treatises. In the next chapter we shall turn to Gerson's somewhat different attitude.

Although subsequent writers were not infrequently to criticize some of d'Ailly's astrological tenets, he escaped unscathed from what was perhaps the most extreme attack made upon astrology during the century, namely, the condemnation of it by the faculty of theology of Paris in connection with the case of Simon de Phares in 1494.[38] The faculty not merely roundly condemned judicial astrology in general, but was careful to specify particularly its departments of nativities, elections, interrogations, and astrological images. But while they condemned to be burned eleven volumes from Simon's library, no work by d'Ailly was included in these, and five works by him, including *On laws and sects against superstitious astronomers,* were mentioned by name as unobjectionable.[39] Perhaps d'Ailly was fortunate in the works by him that happened to be in Simon's library; perhaps also the faculty was inclined to give a clean bill to the memory of a leading alumnus.

[37] BN 2692, fol. 147v: "Concordemus in his cum sancto Thoma in prima parte sue summe in conclusionibus de actionibus corporum celestium et de fato. Concordemus denique cum Alberto magno doctore sancti Thome in illo precipuo tractatu suo qui speculum dicitur ubi hanc materiam plene utiliterque pertractat. Sed hoc de his breviter sufficiant et bene valete." Therewith the letter ends.

[38] Du Plessis d'Argentré, *Collectio judiciorum de novis erroribus,* II (1755), 324–328.

[39] The other titles were: *De imagine mundi, Epilogus mappae mundi, De correctione kalendarii, De cyclo lunari.*

CHAPTER XLIII

JEAN GERSON: A PRE-REFORMATION PURITAN

In Jean or Jehan Charlier de Gerson (1363-1429) we come to a man whose point of view as expressed in his writings is primarily, predominantly, and almost exclusively theological. For we are not concerned with him as a man of affairs, although there too his activity was chiefly ecclesiastical. He is not merely a theologian and reformer whose natural mode of utterance seems to be sermons, whether expressly so named or disguised under the cover of some other literary form. He is also something of a pietist, Puritan, and mystic. Almost he seems the Augustine of the early fifteenth century. He feels it incumbent upon him to inveigh against the *Romance of the Rose* as inciting men to lust and illicit love. He draws up five conclusions against the feast of fools. All six of his sisters decide to remain at home in a state of holy virginity. He feels that just as reason is a virtue superior to sensuality or imagination, since it can abstract the quiddities of things from the confusion of accidents and form specific and general concepts, so there is a power above reason which leads to the knowledge of things eternal and incorporeal.[1] "The knowledge of God through mystic theology is better acquired by penitent feeling than by intellectual investigation."[2] Speculative theology uses reasoning conformable to the physical sciences and to scholastic or literary exercises, but mystic theology is acquired through schooling the emotions and vehement exercise of moral virtues.[3] It is hidden from many clerks, men of letters, scientists, philosophers, and even theologians, and is revealed to many illiterate and simple Christians.[4]

[1] See the 25th Consideratio of his *De mystica theologia speculativa; Opera,* 1494-1502, III, lxv, C.

[2] *Ibid.,* Consid. 28, "Cognitio dei per theologiam mysticam melius acquiritur per penitentem affectum quam per investigantem intellectum."

[3] *Ibid.,* Consid. 30.

[4] *Ibid.,* Consid. 31.

Nevertheless, Gerson feels that some mystics go too far and are guilty of unwarrantable excesses. He feels that it is necessary to prove the spirits,[5] and to distinguish true visions from false.[6] Here not simple Christians but trained theologians are to be the judges whether one offers the genuine coinage of divine revelation or the false money of demons. For we live in the senility of the world when the last hour and antichrist are at hand, and when society, like some delirious old man, suffers from many fantasies and illusions. Such is some brief suggestion of the complex by which the one time chancellor of Paris, leader at the council of Constance, and exile at Vienna and Lyons, was obsessed. It was not an unusual one in those days, but evidently we cannot expect that so religious a thinker and writer, for whom literature and natural philosophy hardly seemed entitled to any independent points of view of their own, and who was so inclined to react against the intellectual scholasticism of the preceding centuries, should allow much latitude to astrology or other occult arts and sciences. Taking everything into consideration, it is perhaps surprising that he concedes as much to them as he does.

In view of Gerson's primarily theological attitude, it is noteworthy that he recognizes the experimental method as characteristic of natural science. In a sermon on Christ's nativity he affirms that the experiments of natural philosophy have never reached this point, that a child could be formed without human seed.[7] But this also suggests the association of experiments with marvelous ends and magic.

Gerson appears to have been less interested in astrology than was d'Ailly, and to have devoted less time to consideration of it, since he wrote only one or two relatively brief treatises dealing with that art or pseudo-science. Of these the chief was his *Trilogy*

[5] See his *De probatione spirituum,* in the Strasburg, 1494-1502, edition of his *Opera,* I, xvii, R-Z.

[6] *De distinctione verarum visionum a falsis, ibid.,* I, xix, L, to xx, B.

[7] *Opera,* II, xlvi, X, "Quid de naturali philosophia eloquar? Eius experimenta numquam ad hoc pertigerant ut absque viri semine puer formaretur."

of Astrology Theologized,[8] composed by him at Lyons in 1419 for the dauphin and only son of the French king, Charles VI—in other words, the future Charles VII. As the title of this treatise suggests, Gerson shared d'Ailly's aim of reconciling astrology and theology. But there is this difference, that Gerson is inclined to make astrology conform to theological requirements, whereas d'Ailly tended to regard astrology as an independent subject with a viewpoint of its own which theology should meet half-way. Of d'Ailly's other chief aim, to emphasize the agreement between astrology and history, Gerson shows little trace. He seems much more suspicious of astrology, more concerned to warn the dauphin from quacks and undue reliance upon the advice of astrologers, and to point out the difficulties and uncertainties to which even the most learned attempts to read the stars are liable. In fact, in his attitude to astrology, he seems far more the pupil of Henry of Hesse than of Pierre d'Ailly.

Gerson opens the *Trilogy* by the observation that all other sciences are the handmaids of theology. Theology, however, does not deny that astrology is a noble science revealed to the patriarch Adam and his successors. But some persons have abused it by adding vain and superstitious observances and sacrilegious errors, and in order to correct them Gerson will lay down thirty propositions. Throughout these he is zealous to affirm the divine control of the stars and heavens, which are neither eternal nor animated, but are constituted by God, are his instruments, obey his nod, act not immutably but contingently, and have no influence upon the creation of rational souls. Gerson grants that the heavens have received divers virtues from God according to the variety of their parts and stars and planets, but he adds by way of qualification that these virtues cannot be comprehended by everyone. Moreover, the influence of the sky is general, and its particular effects vary greatly according to the disposition of inferior objects to receive that influence and the diversity of matter which is "full of seminal tendencies."

[8] *Trilogium astrologie theologizate ab eodem scriptum Lugduni anno domini MCCCCXIX ad Delphinum unicum regis Francie filium.*

Alkindi in his work on rays errs in saying that inferior objects accomplish nothing, and that effects are entirely due to the rays of the stars.

Passing to practical difficulties, Gerson contends that the very complicated movements and combinations of motions of the heavenly bodies are much more ignored than known by men, and that such astrological assumptions as that the heavens have commensurable or incommensurable movements of the signs, and that certain planets dominate this or that people, are quite uncertain. In this connection he cites Oresme and d'Ailly in his support and notes that even the length of the solar year has not yet been precisely determined. He further objects that it is difficult to tell the true position of stars on account of the refraction of their light as it passes through different media as seen from earth. He also raises difficulties in connection with the position of the zodiac and the epicycles of the planets. It is therefore presumptuous upon the part of astrologers to essay particular predictions, and if these come true, it is very likely due rather to suggestion of demons, as Augustine says in his *City of God*. Gerson grants that the sky has much force on dreams and on the flight and noise of birds. But this does not justify oneiromancy, augury, or the traditions of the magicians, who would make geomancy, chiromancy, pyromancy, and the like dependent on celestial virtue, but against whom we see the severity of the law operate, ecclesiastical judges condemning them to prison for life, secular judges to the stake, and God to hell. This incidental information that magicians are less severely punished by ecclesiastical than secular judges is worthy of note, but of course it is to be remembered that the church, in theory at least, did not shed blood or take life, and that even relapsed heretics were handed over to the secular arm for execution.

A number of propositions are then devoted by Gerson to the angels or intelligences who rule—but do not animate—sky, stars, and planets according to God's will. These propositions are less concerned with the subject of astrology than with the powers of angels, demons, and spirits generally. Gerson holds that the

angels or intelligences who move the orbs not only influence our lower world through the heavenly bodies but sometimes directly without such intermediation. He recognizes, however, that the majority of philosophers, Avicenna and Albertus Magnus excepted, would deny such influence except as exercised through the motion of the sky. In Gerson's view these angels or intelligences have no concern with the creation of the rational soul, nor can they themselves drop to that lower status.[9] Nor can they alter human liberty naturally and immediately. But human beings may have recourse to angels as they have to medicine, a concession which would seem to pave the way for pious magic and theurgy, although Gerson warns against the consultation or invocation of evil demons. He states that in answer to prayers the angels can with divine permission stop the sun in its course or prevent fire from burning. But they ought to be moved by devout prayers to God, not by curious inspection and observation of the constellations. Later propositions go on to explain that the actions of angels cannot be subjected to rules. Meanwhile Gerson declares that demons work magic by express or occult pact, and that those who deny the existence and action of demons do so against the express letter of both the Old and New Testaments.

From this digressive incursion into the mysteries of the spirit world Gerson returns in his last six propositions to further consideration of astrology. Human reason overrules the stars, as wise Ptolemy admits. It is unworthy of human reason to worry over vain and false follies. Men should govern their conduct by the consultation of experts and by wise laws, moral or divine, and not by superstitious fallacies or the counsel of men of low birth and no reputation. Gerson affirms freedom of the will and faith in God.

All this has really been little more than beating about the bush. It is after the thirtieth proposition that we come to the crucial question: if trained astrologers of sober and honest life give advice founded in true philosophy and reason, shall we take it?

[9] Fifteenth Proposition, ". . . nec eidem illabi posse."

Gerson's answer is a qualified yes. It is proper to hear them, but one should not follow their prognostication of favorable constellations in a headlong manner and to the exclusion of other counsel. If it is contrary to ordinary human prudence and to the advice of men experienced in the particular matter in question, one had better think twice before following the astrologer's dictate rather than theirs. If both astrologer and medical man agree as to the treatment which should be prescribed for the patient, by all means follow them. If the astrologers advise against opening a battle when the military staff urge it, one should weigh them off against one another very carefully before making a decision. Such illustrations make it evident how large a share in practice Gerson would still leave to astrologers properly trained in astronomy, and how much larger a share many of his contemporaries gave them and others. He closes his treatise by summing up his conclusions in twelve points. Then come six more final points largely directed against the practice, already condemned by Oresme, of states and princes trusting to quacks on their mere assertion that they are astrologers. Gerson recommends that they be first examined adequately by trained astronomers. The astrological doctrine of conjunctions, which Henry of Hesse had rejected and d'Ailly had accepted, appears to be passed over in silence by Gerson. Of d'Ailly's reaction to Gerson's work we have treated in the previous chapter.

In Gerson's discussion *Of Astrological Books which Are Not to be Tolerated* he takes up a less favorable position towards books of nativities and interrogations, images and characters, than Albertus Magnus had assumed in the *Speculum Astronomiae*. Gerson is of the opinion that just as Albert devoted more attention to exposition of natural and Peripatetic philosophy than was quite seemly for a Christian doctor, "adding nothing concerning the piety of faith," so in his approbation of such works of astrology he inclined too far towards superstitions unsupported by reason. Gerson notes with approval that Saint Thomas Aquinas was less favorable to such beliefs and practices. Gerson thinks that such astrological writers as Ptolemy, Albumasar, and

Haly should not be swallowed whole. He commends the following oath which he says is required at Paris of every licentiate in arts: "You shall swear that when you have to settle any question as to philosophy, you will always take the side of the Faith and will overthrow the opposing arguments of the philosopher."[10] Much more do works of astrology require correction and caution. Gerson is like Albert in advising that even the books of condemned magicians and superstitious persons who pretended to depend on astronomy and philosophy should be preserved rather than utterly destroyed. But his motive is different: he would have them kept under lock and key simply for purposes of comparison in order that later books of the same sort might be the more readily condemned. This, he adds, was what had been done at Paris with the books of John de Barro, a superstitious magician who had been burned at the stake; such books were still in circulation in Spain under the title, *Semmaforas*.[11]

Astrology is again touched upon by Gerson in his treatise discussing whether it is permissible for a Christian to observe the heavenly bodies in connection with initiating undertakings.[12] Gerson holds that the existence of free will makes it impossible to constitute any certain and regular art of prediction in such mat-

[10] *Opera,* Strasburg, 1494, I, xx, R, "Iurabitis quod dum contingit vos determinare questionem aliquam de philosophia, illam semper pro parte fidei determinabitis et rationes philosophi in oppositum factas dissolvetis."

[11] *Ibid.,* I, xx, S, "Sicut evenit Parisius de libris Johannis de barro magici superstitiosi combusti quales reperiuntur adhuc in Hyspania sub titulo semmaforas." If we could read *combustis* instead of *combusti,* it would be only John's books which had been burned. This would fit into the sentence better, and agree better with Gerson's assertion elsewhere that ecclesiastical judges sentence magicians to life imprisonment, but would not agree with the present context so well, unless it were understood that only one set of John's works had been burned, and others preserved for record. I find no reference to this John de Barro in the *Chartularium Universitatis Parisiensis.* Those in vol. III, pp. 165, 300, and 344 to John de Barro, commissarius Castelleti Parisiensis, and to John de Barra seem to refer to other persons. Simon de Phares, however, under the year 1390 alludes to Iohannes Barrenses as a magician of the duke of Burgundy whose perversity was discovered by the astrologer, Gencien of Beaugency: *Recueil* (1929), p. 239. Champollion-Figeac, *Louis et Charles ducs d'Orléans,* 1844, p. 408, without indicating his sources ascribes the burning of Jean de Bar to Louis of Orléans.

[12] *Opera,* IV, xiii, M-X, "An liceat christiano initia rerum observare ex celestium syderum respectu."

ters, just as, although some dreams are caused by the heavens and are indicative of the future, others are not, and hence an art of the interpretation of dreams in general is not feasible. Incidentally he asserts that the birth of Christ was miraculous and not subject to the influence of the stars, thereby setting himself in contradiction to d'Ailly on that question. Gerson further argues that the constellations are so varied that their effects could not have all been previously experimentally observed, and that there are terrestrial phenomena so extraordinary and freakish that they could not be predicted from the stars but indicate that it is impossible to measure the effects of the constellations without a knowledge of the readiness of matter to receive these and of the condition of particular agents. He is greatly impressed by the argument of Augustine from twins against astrology, but as a further example of his own of a monstrous birth for which astrology could scarcely account he adduces a two-headed man born on the borders of Brittany and Normandy. One of the heads expressed its desire to live continently, while the other uttered an opposite wish, and one head died half a year before the other. This example, which Gerson affirms is attested "by the most reliable histories," would seem to indicate that, whatever other motives he may have for opposing astrology, a lack of credulity is not one of them. Gerson goes on to say that it is idle for those who put such interrogations concerning the lucky time to begin an undertaking, to contend that their practice is not magic, since geomancy, augury, and observance of dreams can with equal justice claim a natural or astronomical basis, and all these arts are magical. And all magic arts, under whatever special name they may be disguised and palliated, are forbidden by divine law under penalty of death. Gerson agrees with Augustine that all such superstitions are unworthy of a Christian, and that if their predictions come true, it is probably due to interference of demons. A more rational objection which he raises against the observance of beginnings is the query why the first day one wears a certain garment or begins a journey is of any more significance than the second or third day, although as against astrology the objection would seem more valid in the case of

the garment, which might be laid aside for an indefinite period between its successive wearings, than in the case of the journey which if continuous would presumably refer back its second or third day to the same constellations as its first. The closing paragraphs of Gerson's diatribe show that the superstitious practices to which he objects were nevertheless then widespread among great and small, young and old.

Gerson's unfavorable attitude toward astrological and other images and characters is further attested by an opuscule which he wrote at Lyons, December 8, 1428, against the doctrine of a doctor of medicine at Montpellier who had carved the figure of a lion with certain characters on a coin for cure of kidney trouble. Gerson there affirms that any observance whose effect is looked for otherwise than from natural causes or divine miracle ought to be reproved by reason and strongly suspected of a pact with the demons, expressed or concealed. He states that the faculty of theology has so ruled in his time, but I fail to see just such a provision in their decree of 1398, although that is its general tenor. Gerson holds that characters and figures have no purely natural corporeal effect for the cure of kidney trouble, and so cannot produce such effects "except by the mediation of a rational or intellectual substance"—although one might think that a material substance was needed more. Gerson refuses to listen to the contention of Avicenna and others as to the action of the rational soul upon external matter and as to fascination. He seems to imply that it makes some difference from what source or book the Montpellier doctor derived his engraving in determining how reprehensible it was. Thus Gerson appears unaware that this very seal was recommended in the *Conciliator* of Peter of Abano, probably the most influential medical writer of the later middle ages, that Angelo d'Aquila had cited it both from *Conciliator* and from Arnald of Villanova at the close of his treatise on the stone, completed at Paris on the last day of 1415.[13] This same Angelo tells us of a post mortem performed

[13] BN 4120, written in a neat, print-like hand with 37 lines to a page, fols. 89r-109v.

by his master, John Leporis, or others on the corpse of Jean Canard, bishop of Arras, in 1407.[14] But our present interest in Angelo is that his citation shows that reputable contemporary physicians at Paris itself accepted and approved the very astrological image for which Gerson condemned the practitioner of Montpellier. Gerson suggests that the offending physician be let off without penalty if he promises to desist from such practices, using these words: "Now that I have been more fully and better informed concerning the fabrication and use of such images, that they are not in accordance with Catholic tradition, I promise in good faith that henceforth I will never employ them."

This censure of the use of any characters and engravings in medicine, taken together with the oath required of licentiates at Paris, and Gerson's own attitude to the writings of Albertus Magnus in natural philosophy, indicate that theological restrictions were being imposed upon profane science and thought, at least in France, to a greater extent than had been the case in either Albert's day or the fourteenth century.[15] But it is doubtful if the change may be ascribed to the growth of rationalistic opposition to superstitious practices. It is more likely attributable to a reaction against logical scholasticism, an increase of religious obscurantism in connection with the mysticism of the latter middle ages, and to a developing dread of diabolical practices which was presently to flower into the witchcraft delusion and persecution. It is evident that Gerson approaches such matters from the religious and orthodox standpoint and that, although he is a

[14] E. Rodocanachi, *Études et fantaisies historiques,* 2e série, 1919, pp. 55-56, is inaccurate in stating that Angelo in 1407 dissected publicly the corpse of Jean Canard, bishop of Arras. Angelo was merely informed of the post mortem by John Leporis, and it is not definitely stated whether the dissection was public or private: BN 4120, fol. 89r, ". . . et sine excoriatione vesice preter partem cui pars inferior lapidis adherebat ut visum fuit per anathomiam de eo factam post sui mortem ut dictus magister Iohannes mihi verbo dixit et calamo scripsit."

[15] Rashdall, *Universities of Europe in the Middle Ages,* I (1895), 541, has quoted a passage in which Gerson criticizes the theologians of his time for their attention to logic, metaphysics, and mathematics, and their discussion of such matters as the intension of forms and division of a continuum.

learned man, he is primarily a theologian and cannot be regarded as an exponent of the views of the men of science of his time. Nevertheless his view seems not merely to accord with those of a university where theology was the dominant faculty, like Paris, but to carry much weight at a medical center such as Montpellier. Astruc mentions another instance of Gerson's reproving a member of the medical faculty at Montpellier for superstition, which in this case took the form of observance of certain days.[16] Gerson's letter is undated, but since he died in 1429, whereas Jacobus Angeli,[17] the physician who had been the object of his reproof, became chancellor at Montpellier in 1433, it would appear either that Gerson's opposition to such practices had not done much good, or, if we assume that Jacobus had reformed his ways in consequence of Gerson's reproof, that his aberration had not done him much harm. Indeed in 1468 the local Parlement found it necessary to forbid a member of the medical faculty of the neighboring university of Toulouse to practice necromancy any more.[18]

But something more remains to be said of the incident of 1428. This interference of Gerson in the case of the doctor of Montpellier strikes one as almost unprecedented. It was a common event enough for preachers to inveigh against popular superstitious observances, and it was not unusual for Christian writers to question the excesses of astrology. The fields of metaphysics and of scholastic theology bordered so closely then that philosophical vagaries sometimes involved one in dogmatic difficulties. But the practice of medicine had generally been treated as a field quite independent of orthodoxy and where the writs of religious censorship and pious censoriousness did not run. Old wives might be chided for their superstitious remedies, but the members of the learned medical profession and faculties were, tacitly at least, held to be above suspicion. Gerson is, so far as I know, the first to attempt to bind medical procedure by the fet-

[16] Jean Astruc, *Mémoires pour servir à l'histoire de la Faculté de Médecine de Montpellier,* 1767, p. 212.

[17] See Chapter 40 for some discussion of his possible relations to other persons of like name.

[18] J. Barbot, *Les chroniques de la faculté de médecine de Toulouse,* I (1905).

ters of ecclesiastical censure or to conform it strictly to "Catholic tradition." Gerson has often been represented as a great man, but here at least we see him making a great mistake, both of principle and of expediency. He acts the censorious busybody. He does not know where to stop in his theological campaign against superstition; he does not know what to let alone. He goes farther than John XXII had gone; he violates the freedom and independence of the healing profession. Nor has his action the excuse of springing from scientific scepticism: his motive is quite as much the dread of demons. And apparently there was not enough academic spirit and professional pride left at Montpellier to resist him. The incident serves to mark the decline of the school of medicine at Montpellier and the rise of the witchcraft delusion. Only as a sign in either case, it is true, but why should Gerson make himself such a signpost? In general, however, the medical profession seems to have been little affected by Gerson's attitude and to have continued the use of such seals and images as he had condemned.

Gerson attempted to impose his point of view in regard to superstitious observances upon the medical profession in still another connection and treatise, *Errors Concerning the Magic Art,*[19] which, as he states, is an extract from an address which he had delivered to "the venerable licentiates in medicine."[20] From his allusions to the faculty of theology of Paris in the course of the treatise[21] it would appear that these licentiates in medicine were also of Paris rather than Montpellier, and that

[19] The *De erroribus circa artem magicam* occurs in the Strasburg edition of 1494-1502 at I, xxi, F-R, and was reprinted with the *Malleus Maleficarum of* Sprenger and Institor in the four volume, Lyons, 1669, edition, where it begins at II, ii, 163.

[20] *Idem,* "Collaudanti mihi nuper, ut mos habet, venerabiles licentiatos in medicina, oblata est occasio ut contra superstitiosas observationes . . . aliqua dissererem. Ea nunc seorsum ad utilitatem aliquorum separare curavimus ne permixta aliis minus placerent et minus commode prodirent in publicum."

[21] *Ibid.,* p. 165, and especially p. 171. "Haec interim de tota collatione pro medicis antedicta libuit excerpere. Placuit insuper determinatione sacrae facultatis theologicae cuius mentio facta est huic opusculo connectere quia ad dictorum firmitatem etiam non mediocriter utilem iudicavi. Datum per copiam sub signo et subscriptione mei notarii publici subscripti." (*Opera,* I, xxi, O.)

his discourse is therefore to be connected with the period of his chancellorship at Paris.

Gerson makes the penetrating observation that when one censures the pestiferous superstitions of magicians and the follies of old wives and sorceresses who promise to cure the sick by their accursed rites, people object that similar practices of ligatures, characters, figures, and employment of outlandish words may be found on the part of grave and learned doctors of medicine and are inserted in their books. Therefore they must be efficacious, although no natural explanation is offered of them. It is also objected that these practitioners whom Gerson calls superstitious, themselves profess to employ holy things and methods, and that their intention in all this procedure is the service and worship of God and not of the devil. Moreover, it is objected that the church tolerates similar usages in its rites, and Gerson has to admit that there are many popular practices among Christians introduced under the guise of religion which it would be better to omit.[22] But he contends that scientific medicine ought not to admit the superstitious traditions of the methodists and empirics, for which no natural cause can be assigned and in transcribing which writers have followed vulgar errors and the impious rites of magic rather than medical authority.[23]

Gerson now, however, makes some allowance for the effect of such things upon the human imagination, which he had failed to do in the case of images and characters.

If they are said to be performed in order to change the imaginative virtue in the sick person and strengthen his hope of recovery, or in order to divert his thought from his ailment, there would be, I grant, some natural reason in that.[24]

[22] *Ibid.*, pp. 168-169, "Fateor abnegare non possumus multa inter Christianos simplices sub specie religionis introducta esse quorum sanctior esset omissio." (*Opera*, 1494, I, xxi, M.)

[23] *Ibid.*, p. 167, "Philosophia aut medicinalis consideratio nullatenus admittere debet traditiones illas superstitiosas quae dicuntur methodica vel empirica quarum scilicet nulla potest ratio naturalis assignari itaque scribentes ea magis insecuti sunt errorem vulgi aut magorum ritus impios quam medicinae rationes." (*Opera*, 1494, I, xxi, K.)

[24] *Opera* (1494), I, xxi, K, "Si vero dicantur fieri pro immutatione virtutis imaginative in egroto quatinus fortificetur in eo spes sanationis aut ut cogitatio sua aliorsum divertatur, esset hic fateor aliqua ratio naturalis. . . ."

But more than this, Gerson admits natural magic as licit, or at least as a fact and not forbidden by the Faith. Too often things are ascribed to demons which may be accounted for by natural causes, "for who would deny that many marvelous efficacies, many virtues exist in sensible objects by whose combination, alteration, and configuration are produced marvelous effects," such as by use of mirrors, sleight-of-hand, or influence on the imagination.

The knowledge of such operations may be called natural magic, of which the investigation, though it often would be curious and might prevent some more improving occupation or even tend toward error, nevertheless is not contrary to our Faith, provided philosophy, content with its proper limits, does not mix in anything impious, false, or nefarious.[25]

On the whole, this address to licentiates in medicine sounds a good deal like a discreet withdrawal from the uncompromising —and probably untenable—position of censure which Gerson had assumed in the case of the Montpellier physician and the carved image of a lion. The gentler methods of persuasion are now employed, and a large latitude is still allowed to medical magic.

But in general, like all theological writers upon magic, Gerson is much concerned to assert the existence of demons and their relation to most magic. This trite and traditional attitude is of less interest to us than is his testimony that there was a considerable scepticism as to the reality of demons—presumably among the men of science and medical men of his day. Although

[25] *Ibid.*, I, xxi, G: "Neque enim ego negavero quosdam plerumque nimis leviter ea demonibus ascribere que fieri a causis materialibus naturalibus rationabilius dicerentur. Nam multas et miras in rebus sensibilibus efficacias, multas virtutes existere quis negaverit, ex quarum combinatione, alteratione et configuratione fiunt effectus mirabiles, sicut ex applicatione varia speculorum, sicut ex celeri motu et iactatione quarundam rerum, sicut ex immutatione diversa imaginative potentie in hominibus, sicut ex aliis quidam docuerunt et operati sunt, quarum operationum noticia dici potest magica naturalis, de qua investigare quamvis sepe curiosum esset et maioris boni impeditivum, immo et ad errores pronum, non tamen est fidei nostre contrarium, dummodo philosophia suis contenta limitibus nihil impium, nihil mendosum nefariumve miscuerit."

to deny the existence of demons and that they are the operators of multitudinous effects, is condemned among Christians as erroneous and impious and contrary to the Bible, yet there are, he says, those who deride theologians as soon as they begin to speak of demons and to ascribe certain effects to them. Such persons look upon demons as fabulous. Gerson ascribes the prevalence of this erroneous view among certain learned men partly to lack of faith, partly to weakness and infection of reason. Their thoughts are so occupied with the body, sensible things, particular causes, and the examination of visible phenomena, that they are unable to elevate and attenuate their thought to the realm of universals and first entities and spirits.[26]

Gerson felt it necessary to combat not merely the astrological and medical superstition of his time, but also the religious superstitions of the masses. Many say, "I am Christ," some have thought that the name of the future pope was revealed to them, and so on. Gerson thinks, however, that it will not do simply to ridicule and discredit such visionaries and prophets in their own estimation, or we shall seem to call any divine revelation into question, whereas he is convinced that it is still vouchsafed us, for God's arm is not shortened that it can no longer reveal.[27] But he censures the Fraticelli for preferring the prayers of women and devout laymen to the hierarchical acts of sinful priests.[28] It is, by the way, strange that historians have so often represented this doctrine which Gerson here opposes as an attack on the power of the priesthood and sacraments foreshadowing the Protestant position, whereas to insist upon sinless purity in the priest as an essential for the efficacy of the sacrament he

[26] *Opera* (1494), I, xxi, G. "Gerunt proprie animam sic occupatam circa corpus, circa res sensibiles ac earum sollicitas curas, vel ita in causarum particularium et visibilium perscrutatione consistunt, quod de universalibus et primis entibus ac spiritibus nihil credere vel sapere, nihil tenuiter et elevate cogitare possunt."

[27] See his *De distinctione verarum visionum a falsis.*

[28] *Opera,* IV, xvii, Q: "Fundamentalis responsio per duodecim considerationes ad quesita reverendissimi patris ac domini G. de chalancon episcopi Aviciensis contra fratricellum quendam preferentem orationes particularium feminarum et laicorum devotorum actibus hierarchicis ecclesiasticorum sacerdotum et doctorum peccatorum."

performs would seem to increase the emphasis upon his personal importance in the operation and to make a sort of magician of him. Gerson is therefore quite consistent in opposing such a tendency. More evidently bordering upon magic are those who publicly teach or preach to the people that if anyone hears mass, on that day he will not become blind or die a sudden death.[29] Gerson also condemned such popular superstitious observances as uttering incantations (*stulta verba extranea*), or carrying them about in writing, or eating an apple on which words had first been written as a cure for fever, or giving in God's name to aid a woman in childbirth a piece of bread from which one had already taken a bite.[30]

Gerson's treatise on proving the spirits was written at Constance in 1415 in connection with questions raised at that council as to the authenticity of the visions of Saint Brigitta of Sweden (1303-1373) who had been canonized in 1391 by Boniface IX.[31] Gerson approves of the statement of Henry of Hesse that too many persons were being canonized nowadays. He regrets that no middle path seems yet to have been found between the two extremes of accepting false visions and rejecting true ones. It is impossible to lay down any general rule or to read another's motives and inmost experience. He suggests, however, asking the questions: who has had the vision, what has he seen, why, for what end, how, and from what source? He would beware of the supposed revelations of sick persons, the insane, women, and boys.

Gerson was also asked his opinion of a book containing the visions of Ermine in 1395, the last year of her life. His reply was that there seemed to be nothing in it contrary to the Faith, though much that was there stated as miraculous might be ac-

[29] *Opera,* IV, xvi, C-F.

[30] *Opera,* IV, xlvi, Sermo de nativitate domini, opening, "Deus ut nos liberaret disposuit ut hodie. . . ."

[31] *Opera,* I, xvii, Z: "Finit tractatus de probatione spirituum magistri Johannis de Gerson cancellarii parisiensis in Constantia anno domini MCCCCXV in die sancti Augustini tempore generalis concilii inibi celebrati, editus propter aliqua que de canonizatione Brigide in prefato concilio oriebantur sub xii considerationibus comprehensus."

counted for naturally. It was therefore not essential to the Faith to believe all of it, though he would not reject it at first sight. It already circulated in many manuscripts, but he advised against its general circulation on the ground that it might raise an outcry among the hardnecked, scoffers, and sceptics.[32]

Such was the social and intellectual *milieu* that Gerson lived in, and whose superstitious tendencies he endeavored to combat, but rather from the Christian and ecclesiastical than the scientific and rational position, although he did not hesitate, any more than Augustine had done, to borrow arms from reason's arsenal when they would serve his purpose. What a muddle, judged from our standpoint, he gets himself into! In order to disapprove of magic, he affirms the reality of demons; in order to nonplus astrology, he accepts the tale of a two-headed human being. Strict as is his pietism, he allows a certain amount of consultation of astrologers; though he professes himself content with mystic theology, he does not entirely disallow the existence and lawfulness of natural magic. There are, however, many other occult arts and certain sections of astrology of which he utterly disapproves. But the men of his time are much given to them and we may hazard a guess that his opposition to them proved little more effectual than his onslaught upon the *Romance of the Rose.*

How a devotee of astrology would feel towards the memory of Gerson may be illustrated by the words of Simon de Phares, at the end of the century, who says that "this Jerson was a good Catholic, but he had several vices, for he was presumptious and proud and sought to govern princes and to have legations and could suffer no other at court than himself." Having thus subtly suggested to Charles VIII that opponents of astrology are also opponents of monarchy, Simon goes on to charge that Gerson's opposition to astrology was motivated by his jealousy of two physicians of the dauphin who were expert astrologers and enjoyed greater favor at court than himself. Simon adds that Gerson tried to have the book of Jehan de Meung condemned at

[32] *Opera,* IV, ix, R, opening, "Pridem ac pluries nunc litteris nunc viva voce postulasti. . . ."

Paris, "but he found so many opinions contrary to his that he remained confused and ashamed, even as our calumniator."[33]

Thus, while the sceptical and critical attitude towards occult arts and sciences of Oresme and Henry of Hesse is known to d'Ailly and Gerson, and is carried on to some degree by them, it is continued only in a weakened or narrowed form, and apparently without notable success in winning anything like general adherence.[34]

[33] *Recueil* etc. (1929), p. 249.

[34] Gerson's opuscule against the doctor of Montpellier who employed the image of a lion is printed in the *Malleus maleficarum,* Lyons, 1669, II, ii, 175-178. In a MS of 1472 A.D., St. Gall 784, it is followed at pp. 211-212 by his seven propositions on the observance of days.

CHAPTER XLIV

ASTROLOGICAL SURGERY AND MEDICINE

In this chapter we bring together several instances of the prominence of astrology in the surgery and medicine of the first half of the fifteenth century, leaving for subsequent chapters a more detailed account of two prominent physicians of the same period, Antonius Guaynerius and Michael Savonarola, and their relations to other fields of occult science as well as astrology. For the present we shall be principally concerned with the surgical work of Petrus de Argellata, the *Amicus medicorum* of Jean Ganivet, and a controversy at the university of Paris in the field of astrological phlebotomy. We shall not entirely confine our attention to the astrological side of these works, however.

Fossi, in his old catalogue of the incunabula of the Magliabechian library at Florence,[1] stated that Petrus de Argellata, son of Azzolinus of Bologna, took his degree in medicine in 1391, taught logic, astrology, and medicine in his native city, and died in 1423. This statement seems to be correct, since in the *Rotuli* of the faculty of arts and medicine at Bologna, we find Peter teaching logic in 1392-1393, astrology in 1395-1396,[2] and giving the afternoon lecture in medicine continuously from 1415 to 1421.[3] The chief work by Peter to be printed, however, and perhaps the only one extant, is on surgery rather than any of the subjects which he is said to have taught. Fossi lists Venetian editions of 1480, 1492, and 1497 in the Magliabechian library. The *Census of Fifteenth Century Books* in American libraries further

[1] Ferdinando Fossi, *Catalogus codicum saeculo XV impressorum qui in publica Bibliotheca Magliabechiana Florentiae adservantur,* 1793-1795, 3 folio vols.

[2] Rolls are lacking for the years 1390-1392 and 1393-1395.

[3] The two following *Rotuli* for 1421-1422 and 1422-1423 contain but a few names each, either because they are incomplete or the number of the faculty was suddenly greatly reduced. Peter's name does not appear in them. For the *Rotuli* see Dallari's edition, 1888-1924.

lists an edition of 1499.[4] The work was also printed in the sixteenth century.

Peter's six books on surgery, like other works of that time in the same field, are not, however, free either from astrology or somewhat fantastic medical procedure and remedies, points which may be briefly illustrated. Let us first note that Peter represents his work as a publication at the request of his associates or students of the courses of lectures he has given on the third and fourth *fen* of the fourth part of the *Canon* of Avicenna. We may tentatively date such lectures as having been given at some time between 1396 and 1415, and possibly at some other university than Bologna. Thus his work, like most other *Chirurgiae* of the period, is in part a commentary on Avicenna. But his second book takes up varieties of *apostemata* which are not in Avicenna, and, like other surgeons of the time, he occasionally introduces personal experiences. Thus he tells of seeing a man of Piacenza named Antonio who was wounded with an arrow between the eyebrows. Although the arrow penetrated to the depth of four fingers, Antonio was restored to health in a few days, because the arrow penetrated below the cranium. On the other hand, Peter refused to accept the case, or to extract the arrow from the wound, of a young German who was accidentally hit in the back of the head by a bolt from a cross-bow during archery practice and rendered speechless. "And he died within three days. This much concerning fracture of the skull according to moderns."[5] Possibly these closing words are an indication that the personal experiences are taken from some other recent writer such us William of Saliceto.

[4] No further incunabula of the work are listed in GW. The Academy of Medicine, New York, has the 1497 edition. MSS of it are: CLM 7, 15th century, fols. 1-240, Petri de Argillata sex libri de chirurgia; Lyons 251, Opus cirurgicum doctiss. D. Petri de Arzelata, which, however, Delandine must have been mistaken in dating of the 13th century; Oxford, All Souls College 73, 15th century, 274 fols., Petrus de Azzelata Bononiensis de chirurgia libri sex.

[5] Petrus de Argellata, *Chirurgia,* I, vii, 3, "Ego autem vidi unum de Placentia cuius nomen erat Antonius qui cum sagitta fuit vulneratus inter duo supercilia ex opposito nasi et intravit sagitta ad quantitatem quattuor digitorum, et breviter ad sanitatem paucis diebus devenit modo quo dictum est superius et

Argellata's astrological bent is shown by his advising the surgeon not to operate on a fractured skull at the full of the moon, because then the brain increases in size and comes closer to the cranium.[6] For injury to a bone in the head Peter quotes a Fidelis who recommends to give straightway to the patient to drink violets crushed in wine. "And if the right side of the head is injured, bind a crushed violet under the sole of the left foot, and if the left, under the right, and that same day the bone will bend back into place." Ashes of earthworms with crude honey extract fragments of bone, and Chiranus (i.e. the author of the work on occult virtues more commonly known as *Kiranides*) has stated that earthworms superimposed extract the fragments of a fractured jaw painlessly.[7] For further illustration of the tendency of other Italian surgeons contemporary with Peter to astrology and fantastic therapeutic and procedure I may refer the reader to my treatment of Leonard of Bertipaglia in another place.[8]

In the field of astrological medicine probably the most influential treatise composed in Europe during the fifteenth century was the *Friend of Physicians* (*Amicus medicorum*) written by Jean Ganivet in 1431. That his book continued in use for two centuries thereafter may be inferred from the fact that editions of it appeared at Lyons in 1496, 1508, 1550, and 1596, and at Frankfurt in 1614. The author himself explains the title and time of writing, and tells us who he was in the following words:

. . . in this treatise which may be called *The Directory of Astrology Made Medical,* and which was dictated in the convent of the Friars Minor of the city of Vienne by me, brother John Ganivet of the said convent, at the request and instance of Henry Amicus,[9] master in arts

non mirum quia sagitta penetravit infra craneum. In secundo vidi alium qui teutonicus erat et iuvenis erat cum sociis suis et socii sagittabant et breviter vice una exivit de balistra sagitta percussit istum retro in capite et iste cecidit ad terram et numquam locutus est. Ego autem videns hoc dimisi eum et nolui extrahere sagittam et breviter mortuus in tribus diebus. Et hoc de fractura cranei secundum modernos."

[6] *Ibid.*, I, viii, 1.

[7] *Ibid.*, I, vii, 9.

[8] *Science and Thought in the Fifteenth Century,* 1929, Chapter III, especially pp. 79-80.

[9] It may be worth recalling that an English historian of medicine in the eighteenth century was likewise named Friend or Freind (*History of Physick,* London, 1758).

and medicine, a native of Brussels in Brabant, for love of whose name I wished to entitle the present treatise *Amicus medicorum,* since he copied the original of this present treatise and aided in completing the dictation of the same in the current year of the Lord 1431, in the month of September the 28th day and hour of Venus in the place above stated.[10]

From which we see that in Jean Ganivet we have another friar to add to our list of Dominicans and Franciscans who were interested in astrological medicine.

At all events Ganivet is to be congratulated for having written a clear and conveniently arranged work with very little irrelevant matter. Would that more modern historical works were as easy to inspect and analyze as is this well presented manual of astrological medicine![11] The main purpose of the work is succinctly stated in the opening words of the preface:

In the name of the Lord, amen. Here begins a brief treatise to direct physicians in the practice of medicine with reference to the influence of the sky as well in time of epidemic as at other times of the year so that the physicians may themselves know the hours and times when they

[10] I quote from Vatic. 4478, 15th century, fols. 115v-116r; and the 1550 edition, pp. 455-456: "Haec itaque in hoc tractatu qui dici potest directorium Astrologiae Physicatae dictatoque in conventu fratrum minorum Viennens. civitatis per me fratrem Iohannem Ganiveti fratrem conventus praedicti ad requestam atque instantiam Henrici Amici in artibus et medicina magistri de Bruxella in Brabantia oriundi, ob amorem cognominis cuius praesentem tractatum volui intitulare Amicum Medicorum, huius praesentis tractatus originale scribentis et ad dictandum eundem iuvantis atque complentis anno fluente Domini 1431 mense Septembris 28 die et hora Veneris in loco ut supra." The last four words are not in the manuscript. It is a membrane codex of 120 leaves about 10 by 7 inches with a neatly written script page of about 7 by 4½ inches and 28 lines to the page. Our text ends at fol. 116r. Some astronomical figures and a note, "Ad evidentiam et declarationem horarum equalium et inequalium," at fol. 119v complete the manuscript. Another manuscript is Wiesbaden 63, 15th century, fols. 1-94r: "In nomine domini, Amen. Incipit quidam brevis tractatus ad dirigendum phisicos in practica medicine . . . / . . . Explicit Directorium astrologie physicate intitulatum amicus medicorum."

[11] Karl Sudhoff, *Iatromathematiker vornehmlich im 15. und 16. Jahrhundert,* Breslau, 1902, pp. 25-28, has given some account of its contents, but my summary is for the most part taken independently from the Latin text.

ought to give medicines,[12] and how to foretell whether the patient will live or not.

Throughout Alfonso the Wise of Castile is much cited as an astronomical or astrological authority. The book falls into four divisions or *Differentiae,* each of which contains seven chapters. This use of two numbers then commonly regarded as perfect and indicative of the number of inferior elements and of superior planets is probably not accidental, and the number resulting from their multiplication, twenty-eight, is that of the mansions of the moon. The first division deals with the number of heavenly spheres and their movers "according to the doctrine of the ancient philosophers and according to the truth of the theologians correcting the frivolous opinions of the philosophers."[13] The philosophers erred in asserting that the number of intelligences was the same as that of the spheres and also in ascribing eternity and necessity to the heavens.[14] The master of Sentences (i.e. Peter Lombard) holds that God in the beginning created four things, the empyrean heaven, angels to fill it, first matter, and time.[15] The number of angels is not stated in holy scripture nor by any theologian. The philosophers say that the souls of men by strong imagination are joined to the intelligence of the moon.[16] Ganivet, however, in order to demonstrate that "in these inferiors many things happen from the very nature of things without eventuating from the influence of that intelligence of the moon,"[17] tells a story from Nicholas of Lyra[18] of a woman of

[12] *Amicus medicorum,* Vatic. 4478, fol. 1r; ed. 1550, p. 18: "In nomine Domini amen. Incipit quidam brevis tractatus ad dirigendum physicos in practica medicine quo ad influentiam caeli tam tempore epidemic quam aliis temporibus anni ut sciant ipsi physici horas et tempora in quibus debent dare medicinas. . . ."

[13] Vatic. 4478, fol. 1r; ed. of 1550, p. 19: ". . . secundum doctrinam philosophorum antiquorum et secundum veritatem theologorum opiniones frivolas philosophorum corrigentium."

[14] *Ibid.,* Diff. I, cap. 3.

[15] Vatic. 4478, fol. 10v; ed. of 1550, p. 46.

[16] Vatic. 4478, fol. 11r; ed. of 1550, p. 47.

[17] Vatic. 4478, fol. 11v; ed. of 1550, p. 49, "Ex quibus claret multa in istis inferioribus contingere propria rerum natura non provenientia ab influentia ipsius intelligentiae lunae."

[18] The famous fourteenth century commentator of the Bible who introduced this tale in his *Postillae* in connection with the story of Jacob's ewes.

Spain who was unjustly suspected of illicit intercourse with a negro because she had borne a blackamoor, for which the real reason was the effect upon her imagination of a gigantic figure painted in a chorus of Ethiopians upon the wall of her room. The philosophers tell us that if the motion of the sky ceased, all order and action of inferiors would be destroyed, but Joshua in holy writ made the sun stand still, and Hezekiah in *Isaiah* made the shadow of the sun revert ten degrees upon the sun-dial.[19]

Having thus established his orthodoxy, Ganivet turns to matters of astronomy and astrology. The second division of his book treats of the visible zodiac, its parts, and their correspondence to the invisible zodiac of the ninth sphere called the *primum mobile.* Such topics are discussed as the double motion of the sky and the quadruple motion of the seven planets; the five essential dignities of the seven planets, namely, *domus, exaltatio, triplicitas, terminus,* and *facies;* certain accidental virtues of the planets, and detriment to their influence.[20] The third division of the book inquires from what root come plague and death to men, and why more at one time than another, and how to know and prognosticate life or death from the course of nature and influence of the heavens. In its first chapter Ganivet gives four causes of pestilence: divine punishment, the heavenly bodies, corrupt air, and a bad mode of life. In tracing the influence of the stars, one should note especially the entrance of the sun into Aries, eclipses, the sixth and eighth houses—of disease and death—and the planet and sign under which the city in question was founded.[21] The second chapter shows how to stave off ill health by inspecting the patient's nativity and guarding against his weakness—preventive astrology in short. But since the hour of nativity is often unknown, the third chapter instructs how to proceed by interrogations or by inferring the influence of the sky from the nature of the infirmity. In the long fifth chapter are astrological figures

[19] *Ibid.,* Diff. I, cap. 4.

[20] These are the topics of chapters 4, 5, 6, and 7 respectively in Diff. II.

[21] Sudhoff (1902), p. 26. The same points are treated in the annual predictions of the century.

for cases of sickness on August 24, 1418, June 29, 1420, and August 7, 1431.[22]

In the last case at seven hours after midnight, an hour governed by the sun, Henry Amicus of Brussels asked Ganivet whether the dean of Vienne would regain his health or die. Ganivet gives a chart of the constellation when this interrogation was made and on the basis of which he determined the invalid's fate. He found all the conditions bad. That the moon was going into conjunction with the sun within the sun's rays was a sign of death. The position of the planet that kills was also unfavorable. Third, the place of death was in the twenty-sixth degree of Virgo in the ascendent in the house of life. Fourth, the place of life was in the house of death in the twenty-sixth degree of Aries. Added to all this was the fact that these twenty-sixth degrees of Virgo and Aries were *termini* of evil planets, Saturn and Mars. Moreover, the part of fortune was also in a bad position. It therefore was evident that the dean would die soon. But furthermore Mercury, the lord of the ascendent, was near the ascendent in the twelfth house and was ending its direct course and about to begin to retrograde, and was corrupting the ascendent. Ganivet therefore concluded that the dean would not only die but would go mad before a natural day had elapsed. It so turned out, and he died after two days.

Thus, although Ganivet had sided with the theologians against the philosophers, we see that he did not hesitate to practice interrogations, one of the departments of judicial astrology to which the theologians were most likely to object. The fate of the dean was made to depend upon the hour when Henry Amicus happened, or was occultly moved, to inquire as to it. Of course, it might be argued that the interrogation was only as to the dean's physical condition and did not violate his freedom of action. But the act of making the inquiry might be an act of volition on the part of Henry Amicus and therefore could hardly be subject to the stars.

[22] These figures occur at pp. 257, 299, and 305 of the edition of 1550, and on fols. 62v, 73r, and 74v of Vatican 4478.

The fourth division of Ganivet's work inquires how to preserve health, how to expel disease, and how to fortify medicines by means of astrological knowledge. Its first chapter sets forth a method of comforting each of the four virtues of the human body when a corresponding constellation reigns in the sky. The second instructs how to purge bad humors by availing oneself of the aspect of the planets which is suited for this. The third chapter relates the parts of the human body to the parts of the sky. The fourth deals particularly with the matter of astrological elections in curing the eye or ear, and relates the seven tunics of the eye to the seven planets. The remaining chapters concern fevers, phlebotomy, and the times for taking cordials.

Following the *Amicus medicorum* are another shorter astrological tract called *Caeli enarrant* from its opening words and an abbreviation of Abraham Avenezra on critical days. Both seem the work of Ganivet since they are terminated by an epilogue which keeps referring to the *Amicus medicorum*. Moreover, the *Caeli enarrant* contains an interrogation made on August 17, 1417 at Vienne by John Symon, master in arts and licentiate in medicine, as to the election of a new pope at the council of Constance.

In 1437 a controversy occurred at the university of Paris as to what days were favorable for blood-letting and the taking of laxatives. Denifle and Chatelain, in the *Chartularium Universitatis Parisiensis*,[23] merely refer in a footnote to the brief notice of the matter in the late fifteenth century work of Simon de Phares,[24] but a full contemporary account of the controversy is preserved in a Latin manuscript of the Bibliothèque Nationale.[25]

Roland Scriptoris, master of arts and medicine, and Laurens

[23] *Chart. Univ. Paris.*, IV, 543.

[24] *Recueil* (1929), pp. 253-254.

[25] BN 7443, fols. 184r-211v, opening, "Super controversia mota inter venerabiles et discretos viros magistros Rolandum scriptoris ma. in artibus et medicina et Laurentium muste ma. in artibus et bachalarium in theologia pro coniunctionibus et oppositionibus solis et lune electionibus certarum dierum et noctium pro fleubotomiis et laxativis anni 1437. . . ." This MS was noted by A. Chéreau, "Les médecins de Louis XI," *Union médicale*, XV (1862), 344, who made some reference to the affair.

Muste,[26] master of arts and bachelor of theology, had advanced divergent opinions. Roland had criticized Laurens for stating that January 2, 1437, would be favorable for bleeding, and, on the other hand, had declared that the eighth day of that month would be more suited for phlebotomy than had been indicated by Laurens who had marked it in his almanac with only a half cross, whereas in Roland's opinion it should have been designated with a full cross. In order to adjust these and similar differences between Roland and Laurens, the rector and other university authorities appointed two arbitrators: Jean de Troyes,[27] master in theology and minister of the order of the Holy Trinity, and Simon de Boesmare,[28] prior of St. John's of Beaumont.[29] The cooperation of masters of theology and persons holding prominent ecclesiastical positions in such astrological medicine, not to say, superstition, is to be noted. Indeed, Simon de Boesmare's interest in astrology appears to have extended to the casting of nativities, for later on in the same manuscript which records the controversy of 1437 occurs an astrological diagram of the state of the sky at the time of the conjunction of sun and moon which shortly preceded his birth on November 27, 1380, at 4.18 P.M.[30] and another of the constellations at the time of his birth on December 8, 1380, at one hour and twenty-seven minutes before noon.[31]

[26] He is mentioned as a *cursor* in 1431-1432: *Chart. Univ. Paris.*, IV, 543.

[27] Frequently mentioned in the *Chartularium* as one of the faculty of theology.

[28] His name seems not to appear in the *Chartularium*.

[29] BN 7443, fol. 184r, "Magister Iohannes de Trecis magr. in theologia magnus minister ordinis sancte trinitatis et redemptionis captivorum et dominus Simon de Boesmare prior sancti Iohannis de Bellomonte Rogeri (?) ad hoc commissi et deputati per dominum rectorem et deputatos universitatis parisiensis. . . ." I assume that "Rogeri" should go in some way with the name of the priory rather than indicate a third arbitrator.

[30] BN 7443, fol. 237v, "Figura dispositionis celi in hora et puncto coniunctionis solis et lune precedentis tempus nativitatis Simonis de Boesmare que fuit anno domini 1380, 27 die novembris post meridiem per 4 horas cum 18 minutis."

[31] BN 7443, fol. 238r, "Figura dispositionis celi in hora et puncto nativitatis Simonis de Boesmare complexionalisque diurne que fuit anno domini 1380, 8a die mensis decembris ante meridiem per unam horam cum 27 minutis. Hora Iovis." I am not certain whether "ante meridiem per unam horam cum 27 minutis" means 11:27 A.M. or 10:33 A.M.

In the manuscript which records the affair we are given Roland's criticism of Laurens, Laurens' justification of his opinion, and the decision of the umpires, who usually take middle and conciliatory ground between the two parties. For example, they state that it is a matter of indifference whether the eighth of January is marked with a full cross or a half one.

As for the ninth day, master Roland says that it should not be included, because the moon is motionless through the whole morning, when phlebotomies are commonly performed, and then too it is in the last *terminus* of the sign Aquarius—two things which prohibit bleeding. Therefore the ninth day should not be included.

And master Laurens says that it should not be left out, because the moon is quasi-motionless in Pisces, approaching Venus slowly from the fourth aspect.

The aforesaid (referees) say that to name or not to name that day seems practically a matter of indifference, because the sign is good, but the moon is in a *terminus* of Saturn.[32]

It was, however, also the opinion of the arbitrators that every physician and every surgeon should possess a copy of the great Almanach—and not merely of the small one—in order to tell what sign the moon was in every day and with what planets, good or evil, it was related.

The importance of these almanacs in medicine is further illustrated by a document of 1452 concerning John Avis's petition to substitute three years of study elsewhere for five months that he lacked of the time required in residence for the baccalaureate in medicine at Paris. The medical faculty granted his request with the further understanding that he should yearly present

[32] BN 7443, fol. 187r, "Quo ad IXam diem ma. Rolandus dicit quod ipsa non debet poni, quia luna est vacua cursu per totum tempus ante meridiem in quo fleubotomie communiter fiunt et est eo tunc in termino ultimo signi aquarii que duo similiter prohibent fleubotomiam. Ergo IXa non est ponenda.

Et ma. lau. dicit quod non debet omitti quia luna est quasi vacua cursu in pisci(bu)s applicans tarde ad venerem de quarto aspectu.

Dicunt predicti quod nominare istam diem vel non nominare videtur quasi indifferens quia signum est bonum sed luna est in termino saturni."

them with a copy of the large and small almanacs.[33] This John Avis, or Jehan Advis, is mentioned half a century later by Simon de Phares under the year 1492 as a doctor of medicine who had composed almanacs for the past thirty-nine years and who had recently at the table of the bishop of Paris spoken up in defense of Simon's astrology.[34] His brother, Hervé Advis, now a Celestine monk, had spent most of his youth upon astrological judgments according to Simon de Phares.[35]

As for the arbitrators of 1437, they further recommend that every physician and surgeon should have an astrolabe "in order to select for every day, every hour, and for fractions of the hours an ascendent sign corresponding to the sign in which the moon is found."[36] One could hardly hit upon a better proof of the great stress then laid upon a meticulous observation of astrology in the practice of medicine in even so stout a stronghold of orthodoxy as the university of Paris. Its faculty of medicine was indeed for a long time designated "Facultas in medicina et astrologia."[37]

Roland Scriptoris, we learn from the *Chartularium* of the university of Paris, received his licentiate in medicine on March 3, 1424. His name appears in lists of the masters of the faculty of medicine between 1424 and 1439. In 1427 he petitioned Martin V for a dispensation from his defect of birth. From 1427 to 1430 he was dean of the faculty. In 1430 he was a canon of the royal chapel. We have records of his borrowing a copy of Livy from the library of Notre Dame and in 1435 an astrological work from the Sorbonne. The surgeon, Iohannes Textoris, praised him for his skill in medicine and surgery. By 1442 he seems to have left the university.[38] He is presumably the same person as a Roland Scriptoris of Lisbon, master of arts and medicine,

[33] *Chart. Univ. Paris.*, IV, 711, Doc. 2686, ". . . ipse dabit facultati unum almanach magnum et unum parvum."

[34] *Recueil* (1929), p. 266.

[35] *Ibid.*, p. 268.

[36] BN 7443, fol. 186v, ". . . ad eligendum pro qualibet die qualibet hora et fractionibus horarum signum ascendens correspondens signo in quo sit luna."

[37] Chéreau, *Union médicale,* XV (1862), 343.

[38] *Chart. Univ. Paris.*, IV, 520, 549, 593, 601, 607, 614, 629, 635. Delisle, *Cabinet des manuscrits,* III, 314.

and physician to John, duke of Bedford, who composed a work of geomancy found in a manuscript now in the British Museum.[39] It shows that he could descend lower than astrology in the scale of superstition. His geomancy is, however, "reduced to an astronomical basis as far as possible."[40] Since the duke of Bedford died in 1435, this geomancy was probably written before the controversy of 1437 concerning days good for phlebotomy and laxatives.

This same Roland Scriptoris who again styles himself "of Lisbon" also addressed to the duke of Bedford an elaborate treatise on physiognomy in six tractates. Of these the third, in thirty-two chapters, dealt with chiromancy. Here, too, an astrological association was attempted, the parts of the hands being related to the planets and instructions being given how to determine under what planet a person was born from examination of his hands. The first tractate had discussed the relations of mind and body; the second, fourth, and fifth detailed the physiognomy of various parts and functions of the body. The sixth and last tractate devoted twenty-six chapters to as many types of human character and the outward signs by which they may be recognized, whether of good intellect or bad morals, bold or timid, servile or avaricious, derisive or pusillanimous.[41]

The astrological reputation of the masters of Paris is further

[39] Sloane 3487, quarto 15th century, 193 fols., "Explicit aggregatorium sive compilatorium geomancie editum per Ro. Scriptoris . . . quantum possibile est ad astronomiam redacta. Et est scriptum per Martinum Carum auctoritatibus Apostolica et Imperiali notarium." The MS is neatly written in a large hand with illuminated initials. In *Magic and Experimental Science,* II, 120, I was mistaken in conjecturing that "Ro." stood for Roger or Robert: Scott's printed *Index* had already correctly given the name as Roland Scriptoris.

[40] At first he relates the sixteen geomantic figures to the planets, signs, and other divisions of the sky. There follow various rules for answering all possible questions. Fols. 80-131 of the manuscript are occupied with tables of reference. From fol. 132r to the end various questions are answered according to the twelve houses of the heavens. Under each house are found from half a dozen to forty chapters.

[41] MSS are Oxford, St. Johns College 18, 15th century, 256 fols.; BM Royal 12 G XII, 15th century, fols. 10-103: see the respective catalogues for full descriptions. The title of the work is *Reductorium phisionomie* and the incipit of the text proper, "Cum agendi modus et operandi. . . ."

attested by ascription to them of two lists of dangerous days in a Barberini manuscript at the Vatican.[42] These cannot be dated, although the manuscript itself appears to have been written or copied at the close of the fifteenth century. But it included treatises of earlier authors like Arnald of Villanova or Iohannes de Merliano. Nor is it at all certain that the writers of these lists are justified in invoking Parisian authority. The first list which is attributed to a master of Bologna and astronomers of Paris consists of thirty-one days[43] in each year on which it is inadvisable to initiate undertakings: six in January on the first, second, fifth, seventh, eighth, and seventeenth of the month; the others on February 16, 17, and 18; March 15, 16, and 17; April 8, 15, and 17; May 7, 15, and 17; June 5; July 15 and 17; August 6 and 10; September 16 and 18; October 16; November 16 and 17; December 6, 7, and 27. The second list of thirty-three or thirty-four days is ascribed to the masters and astrologers of Paris.[44] They are distributed among the months in the same proportions as before except that March and May now each have four instead of three such days. But the days are designated by their names in the ecclesiastical calendar rather than by the number of the month. Those of each month are also unlucky for some particular specified thing. On those in January one should not change his place or marry. On those of February he should not go to war. And so on. These lists of days seem a continuation of the long-standing observance of "Egyptian days"[45] though they are not so designated in our manuscript and do not fall on the same days of the months.

Between these two lists of dangerous days there occurs in the

[42] Vatic. Barberini 186, written about 1493 A.D., fols. 33r and 55v.

[43] The heading gives the number as thirty-two: "Nota quod in quolibet anno sunt xxxii dies periculosi sicut a magistro Bononie similiter ab astronomis Parisiis previsum est." But those named count up to only thirty-one.

[44] "Notandum quod in anno sunt xxxiiii pericula scilicet a magistris Parisius et ab astrologis previsum et magistri dicunt quicumque homo in istis diebus se non custodierit pericula subsequentia sive morte(m) non evadet." Here again the days specified seem to reckon up to one less than the number given in the heading.

[45] See *Magic and Experimental Science,* I, 685.

same manuscript "A Notable *Practica* at the university of Paris by the astrologers according to the course of the planets and elements from which can be seen and known the nature of a man from his appearance." But the ensuing text seems pure physiognomy from the hair, eyes, eyebrows, nose, and so forth.[46]

Another effort to enlist the authority of Paris on the side of astrology is seen in a prediction put in the mouth of Gistaldus de Melodija, doctor of decretals, supreme astronomer of the high hierarchy of the college of Paris and other astronomers there assisting. They announce that about January 10, 1469, will begin the delusion of the world, the evacuation of the clergy, derision of Christianity, and deposition of potentates, while on February fifteenth will occur an eclipse of the moon.[47]

In the same year, 1437, that the controversy took place at the university of Paris, someone finished either composing or copying "A Treatise of Astronomical Physic for the greater security of the exercise of the art of medicine."[48] The manuscript in which this composition occurs is now in the library at Wolfenbüttel, but it came from some English monastery. It is a different work from that of Ganivet. Such questions are put to the stars as: what is the cause of the sickness and nature of the disease? is the sickness curable? will the physician benefit or harm the patient? in what part of the body is the disease, above or below, on the right or left side, before or behind? is the sickness one of the body or soul? is it new or inveterate? will the disease alter from one form to another? what will the color of the urine be? when will the patient recover or die? The author also considers the relation of the signs and planets to different parts of the body and their ailments. The treatise is briefer than Gani-

[46] Vatic. Barb. 186, about 1493 A.D., fols. 43v-45v.

[47] Vatic. Palat. 1438, fols. 159r-160r.

[48] Wolfenbüttel 3549 (51.9. Aug. 4o), Perg., 13th-15th century, fols. 123r-133r: rubric, "Incipit tractatus phisice astronomice ad magnam securitatem exercitii artis medicine"; incipit, "Radicem fidei non enervat (?) corpora planetarum . . ."; desinit, ". . . mortis ipsa hora inducetur salus. Et sic finitur tractatus parvus sed utilis anno gratie 1437: Benedictus Deus Amen." This treatise closes the MS, following various arithmetics, geometries, and works on the astrolabe of the thirteenth and fourteenth centuries.

vet's, covering only some ten leaves. Such Arabic astrologers as Aomar, Haly, and Alkindi are cited; also Dorotheus, Aristotle, Grosseteste, William of England, and Roger Bacon. These last citations as well as the provenance of the manuscript rather point to an English author.

Aphorisms ascribed to Caciaguera, a physician of Faenza, in an Italian manuscript of the fifteenth century which is now at the Bodleian library, Oxford,[49] appear from the opening words to have been concerned with astrological medicine. This Caciaguera, of whom I have found no other account, may of course be earlier than the date of the manuscript.

Other instances may be given of the prevalence of astrological medicine in the first half of the fifteenth century or of men who were at once physicians and astrologers. In Germany we may note one Johann Reyer Amerbach,[50] who occupied the position of municipal physician at Frankfurt during the years (1432-1435) just following the composition of Jean Ganivet's *Amicus medicorum*. Or in Flanders we may note Jehan de Bruges, a student of medicine and astrology at the university of Louvain in 1444, who has left a book in twelve chapters on great conjunctions, of which fifteenth century manuscripts in French are preserved both at the Bibliothèque Sainte Geneviève[51] and the Bibliothèque Nationale in Paris.[52]

In the prologue[53] Jean de Bruges denies any tendency to sortilege or infringement upon freedom of the will. The stars do not impose necessity but only show probable inclination. Ptolemy and Galen are cited and the *Speculum astronomiae* of Albertus Magnus twice. In the first chapter Aristotle's or rather Albert's *De proprietatibus elementorum* is cited.[54] Jean also makes frequent reference to the Arabic writers on astrology, and mentions such Latin authors as William, bishop of Paris,[55] of the thirteenth century, and the astronomers, Iohannes de Linieres[56] and Jehan de Muris[57]—to follow his own mixed spelling—in the fourteenth century. He also refers to the defeat of the French by the English in 1415.[58] After three opening chapters on the nature of the sign Scorpion,[59] the nature of the bodies in conjunction,[60] and the nature of the aquatic *triplicitas*,[61] Jean de Bruges takes up four particular conjunctions, three in the past and one in the future. The second conjunction was on the last of October in the year of Jesus Christ 1032; the third was in 1425; the fourth and last will be in 1484. Jean then considers the nativity of Jesus Christ, the advent of antichrist, the renovation of the world, and the end of this age or world.[62] Simon de Phares alludes to a prognostication which Jean de Bruges had made from the year 1444 to the end of the world, as well as to Jean's work on conjunctions,[63] but our analysis of the latter makes it seem probable that they were one and the same work.

An anonymous "astronomical treatise on the prognostication of diseases" occurs twice in a manuscript of the fifteenth century, but cannot be dated more definitely. Its five chapters dis-

[49] Canon. Misc. 46, 15th century, fols. 79-80: incipit, "Maxime consyderabis si signior (*sic*) sexta domus sit in aliquo gradu. . . ."

[50] Concerning him see O. Feis in *Archiv für Geschichte der Medizin*, XVIII (1926), 269-270, "Artz und Astrologe. Lesefrucht."

[51] Ste. Geneviève 2521, 15th century, fols. 37-57v: "Le livre des grandes conjonctions et mouvemens du ciel et des jugemens sur iceulx, fait et compillé par maistre Jehan de Bruges, médecin et astrologien estudiant en l'université de Louvain, en l'an . . . 1444."

[52] BN 7335, 15th century, fols. 115r, col. 1-131r, col. 1. "Cy lensup(er)vene Iugemens et plusieurs prenosticacions de fortunes et aventures de la disposition mutacion et changes de temps qui seront et ont este depuis la creation du monde jusques a la fin . . . et concordante avec la saincte escripture fait par astrologie sur les grandes conjonctions et mouvemens de la huite espere . . . que fist et compost maistre Jehan de Bruges." At the end the work is dated 1444.

[53] BN 7335, fol. 115r, col. 2: rubric, "Cy sensuit le prologue dicellui livre avecques lexcusacion de lacteur."

[54] *Ibid.*, fol. 116r, col. 2: "Pour ce que dise le philosophe ou livre de la nature de la propriete des elements."

[55] *Ibid.*, fol. 118v, col. 1.

[56] *Ibid.*, fol. 123v, col. 2.

[57] *Ibid.*, fol. 119v, col. 1.

[58] *Ibid.*, fol. 121r, col. 1.

[59] *Ibid.*, fol. 116r, col. 2: "Le premier chappitre de la nature du signe de le scorpion."

[60] *Ibid.*, fol. 117r, "de la nature des choses conjonctes."

[61] *Ibid.*, fol. 118r, "de la nature de la triplicite deau."

[62] *Ibid.*, fol. 124r, col. 2, "Le 8 chappitre de la nativite Ieshu crist"; fol. 125v, col. 1, "le 9 chappitre de ladvenement de lantichrist"; fol. 126v, col. 2, "Le 10 chappitre de la renovation du monde"; fol. 127v, col. 2, "Le 11 chappitre de la fin de ce siecle"; fol. 129v, col. 2, "Le 12 chappitre de la conclusion final."

[63] *Recueil* (1929), pp. 27, 255.

cuss the astronomical instrument to be employed, how to find the true places of the planets and true conjunctions of the luminaries, how to find the true place of the sun, the prognostication of days and the influence of the superior bodies, and the properties of the signs and planets. At the close other signs of crises are given than astrological; thus seeing a bath in a dream means that the patient will have a critical sweat on the following day.[64]

A brief treatise by Petrus de Iovenetis of Bologna on the astrological administration of drugs and medicines[65] was apparently written in 1414 or 1404, which is the date given in an example of astronomical observation.[66] Peter first treats of vomiting, evacuation at stool, and bleeding according to the movements and positions of the heavenly bodies. Second, he explains why evacuation of humors depends more upon the movement of the moon through the signs than on the other planets. Third, he inquires why some places in the zodiac are favorable and others unfavorable to such evacuation. Fourth, he gives rules for finding the position of the moon, adding a distinction between solar and lunar months. The three watery signs are those favorable to evacuation. Of these, Cancer and Scorpio are retrograde signs, and hence emetics should be administered while the moon is in them, and laxatives should be given when it is in Pisces. Peter

[64] FL Ashburnham 134 (208-140), 15th century, paper, double columns, pp. 211, col. 2-216, col. 2; and again, 289, col. 2-296, col. 2. "Honestum quoque est huic salutem promittere, aliquando (*alii* in the second text) vero mortem pronuntiare . . . / . . . cum doctores sufficienter de talibus determinaverunt. Laus deo, Finis." In the MS are also found such works and authors as the *Flores* of Albumasar, Alcabitius, Sacrobosco, Campanus of Novara, and from the fifteenth century Prosdocimo de' Beldomandi.

[65] FL Ashburnham 1448, fols. 125r-127v: "In Christi nomine, Amen. Incipit tractatus secundum Petrum de Iovenetis de modo exibendi farmaca canonice per viam astrologie. Cum pluries a confratribus plurimis quibus amicitie lege . . . / . . . 26 dierum et 22 horarum. Explicit tractatus secundum Petrum de Iovenetis de Bononia."

[66] *Ibid.*, fol. 127r: "Et pone exemplum in 1414 (it looks as if 1404 may have been written originally) 21 martii hora 22 horologie fuit coniunctio solis et lune. Ego nunc sum in 5 Aprilis die circha 20^{am} horam et modo sensibili procedendo quod inter illam diem et presentem sunt 15 dies demptis duabus horis et reperio quod coniunctio fuit in 6° gradu arietis."

refers to another *Questio* of his on critical days. His name does not seem to appear in the salary lists of the university of Bologna, but of course he may have been born at Bologna but have taught elsewhere.

CHAPTER XLV

GIOVANNI DA FONTANA: THE APPLICATION OF MECHANICAL INGENUITY TO SCIENCE[1]

In 1544 there was printed at Venice by Octavian Scot under the name of Pompilius Azalus of Piacenza a work on all natural things contained in the universe, whether celestial or terrestrial or mathematical, and concerning the angels and movers of the heavens. The work is listed by Graesse,[2] but not by Brunet. There is a copy in the British Museum[3] and one on the reserve at the Bibliothèque Nationale.[4] There appears to be no other edition of the work, and I know of no manuscript of it.

The work is dedicated to the emperor, Charles V, in the preface to whom the captivity of Francis I at Pavia is mentioned, and who appears to have asked Azalus to write on natural phenomena. In modern works on Charles V, however, there seems to be no reference to Azalus and his book. He represents himself in the preface as both a university lecturer upon medicine and a practising physician, and as further burdened with the load of a family and sons. He apologizes for his lack of eloquent and elegant diction, an amenity which his adverse fortune and occupation with other arts have prevented him from acquiring.

[1] This chapter is an outgrowth from an article published in *Isis*, XV (1931), 31-46. *Ibid.*, XVII (1932), 34-53, for further information concerning Fontana in the subsequent article of Alexander Birkenmajer, "Zur Lebensgeschichte und wissenschaftlichen Tätigkeit von Giovanni Fontana (1395?-1455?)."

[2] Jean George Théodore Graesse, *Trésor de livres rares et précieux*, Dresden, 1859-1869, 7 vols. A recent sales catalogue therefore does not seem wholly justified in describing our book as "resté inconnu à tous les bibliographes."

[3] Azalus (Pompilius), *Liber de omnibus rebus naturalibus quae continentur in mundo; videlicet coelestibus et terrestribus necnon mathematicis et de angelis motoribus quae coelorum*, Venetiis, 1544, fol. "Motoribus quae," of course, is a misprint for "motoribusque."

[4] *Liber Pompilii Azali Placentini de omnibus rebus naturalibus quae continentur in mundo, videlicet coelestibus et terrestribus necnon mathematicis, et de angelis motoribusquae* (sic) *coelorum*, Venetiis, apud Octavianum Scotum D. Amadei, 1544. In fol.

Perhaps this is the reason why his name does not appear in histories of Italian literature or in such a specialized work on the literary history of Piacenza as that of Poggiali.[5] Nor is it found in such other historical works on Piacenza as I have had access to. Only in histories of medicine is he mentioned and there very briefly. De Renzi credits him with an interest in botany and cites Haller's *Biblioteca Anatomica* for his interest in anatomy.[6] But this is very likely nothing more than inference from the title of the work ascribed to him. Since he treated "of all natural things," surely he must have included herbs and human anatomy.

We need not worry ourselves overmuch as to who Pompilius Azalus was, since he was certainly not the author of the work before us or perhaps even of its preface or at least not of all of it, nor, so far as we know, was he the author of any other work. He therefore is of no interest to us as an author but only either as a gross liar himself or the invention of an unscrupulous publisher or possibly as the victim of circumstances. But to continue with the preface, in which Azalus is still supposedly speaking. He says that if his work is not just what the emperor had expected, at least it will be so plainly set forth that it can be understood without further explanation at first reading. His understanding is that the emperor does not want new doctrine but a collection of previous authorities in one volume. He dwells, however, upon the labor to which he has been put in its composition and further expresses his hatred of those who plagiarize the works of others and suppress the authors' names.

The preface then turns to the plan of the ensuing work and states that it wanders as it were over the whole world and is divided into five parts. The first treats of the parts of the world, their order, and the sites of those which are not manifest to the eye, with many theological and philosophical questions annexed. The second part is especially concerned with the orbs of the

[5] C. Poggiali, *Memorie per la storia letteraria da Piacenza*, Piacenza, 1789, 2 vols.

[6] Salvatore De Renzi, *Storia della medicina italiana*, Napoli, 1849, 2nd ed., 5 vols., III, 98 and 287.

sky, the planets and their various movements and properties. The third part deals with the four elements and such related phenomena as winds. The fourth part discusses the habitable world, its divisions, and the effects of the heavens upon different longitudes and latitudes. The fifth part is about the quantities (qualities?) of the elements, the heavens and stars, and of the marvelous things in any sphere of things active and passive, forsooth, air, fire, water, and earth, and various minerals, plants, and animals. This program, with its strong flavor of astrology, is fairly well carried out in the subsequent text, so that one suspects that this concluding portion of the preface is from the pen of the author of the text and not of Pompilius Azalus, whose warning to Charles V that he would find the ensuing work different from his expectation we are now to find amply justified.

For the text bears unmistakable and frequent signs of being the work of an Italian author of the previous century and not of Pompilius Azalus at all. Moreover, this author lived in the earlier part of the fifteenth century. He speaks of Paul of Venice who died in 1429 as having once been his preceptor in the liberal arts, and marvels that Paul, Augustinian Eremite as he was, should have adhered to the opinion of Averroes rather than to that of Augustine.[7] Blasius of Parma (Biagio Pelacani) who died in 1416 likewise was at one time our author's teacher[8] and used to tell of a reflection of the Milanese army in the sky which he had seen in 1403.[9] Our author further refers to "our friend,"

[7] Edition of 1544, fol. 2v. After arguing against the doctrine of the unity of the intellect as diabolical and erroneous, our author says: "hic admiror permaxime de Paulo Veneto ordinis Haeremitarum Sacrae Theologiae doctore olim in artibus praeceptore meo qui huic Averrois opinioni plurimum adhaeserit et non verissimo sanctissimoque Patri suo Augustino. Nemo certe ita sapiens est qui quandoque non descipiat."

[8] Edition of 1544, fol. 41v (II, 10): "Recitat tamen Blaxius Parmensis doctor meus quod aliqui sapientum non attribuunt coelo lunae istum quintum motum. . . . Sed ego simul cum prefato doctore meo salva pace illorum credo quod celum lunae non sit excerptum ab ipso motu."

[9] *Ibid.*, fol. 75r: "Recitat enim Blaxius Parmensis olim doctor meus semel apparuisse tempore suo anno gratiae MCCCCIII in Lombardia iuxta castrum quod dicitur Buxetum per tres dies omni die ante horam tertiarum in nubibus equites et pedites armatos."

Prosdocimo of Padua, who had drawn up some of the most recent astronomical tables.[10] Undoubtedly this was Prosdocimo de' Beldomandi, noted writer on astronomy, mathematics, and music, who died in 1428.

In the text, moreover, someone is addressed a number of times in the second person who is certainly not the emperor, Charles V, but whom the author calls "my son," and in one place, "my Octavian."[11] In another passage he states that, as he was about to terminate the section of his work dealing with images in the heavens, there came to him as he was writing a studious youth who wished to know further why the ancients so often conceived the constellations in human or animal form.[12]

Furthermore, our author indulges in certain definitely dated personal reminiscences. He recalls the damage wrought on August tenth, 1410, by the worst wind in all the history of Venice.[13] He tells how "a certain man of subtle genius and invention who constructed an instrument in 1416 called The Mirror of the Planets thought that the sun had an epicycle but no deferent," a view of which our author disapproves.[14] Our author was once

[10] *Ibid.*, fol. 35v (II, 3): "Prosdocimus Patavius amicus noster qui novissimas tabulas instituit."

[11] *Ibid.*, fol. 31v, "Nollem tamen, fili mi, ad has artes quas ecclesia prohibet te avertas"; fol. 35v, "Sed adverte, fili mi . . ."; fol. 41r, "Tu quoque, Octaviane mi, priusquam finem libro imponam; operis coelestis fabricam intelliges esse mirandam"; fol. 66v, "Nec credas hoc, fili mi, esse impossibile vel fabulam poetarum."

[12] *Ibid.*, fol. 28v: "Volebam finem hactenus imposuisse sermonibus de imaginibus supercoelestibus, putans quantum ad propositum opus explicare decreveram satis dixisse. Sed mihi scribenti supervenit quidam studiosus adolescens cupidus ulterius scire cur veteres has formas hominum et animalium magis quam aliorum in coelo conceperint. . . . Nec tibi displicebit, ut opinor, haec prolixitas qui poetarum libros legis."

[13] *Ibid.*, fol. 71r, "Et ipse memor sum anno ab incarnatione domini nostri M.CCCC. decima die mensis Augusti qua celebratur festum beatissimi Laurenti. . . ." Thus the edition gives the date as 1400, but probably a "X" or "decimo" has been omitted by confusion with the "decima" for the day of the month which immediately follows. Concerning the storm of August 10, 1410, see Hazlitt, *The Venetian Republic,* I (1915), 813; Sabellico, *Degl' Istorici delle cose Veneziane,* Venice, 1718, II, ix, 463. Other undated Venetian recollections are: at fol. 84v, of a flood; fol. 118v, death of a noble lady, Dacha Boldermerio; and fol. 127r, concerning a woman at Udine who hatched hens' eggs by placing them between layers of manure.

[14] Edition of 1544, fol. 45v: "Hoc loco nolo praetermittere quod quidam subtilis ingenii vir et inventionis composi-

sent by the doge of Venice to Brescia to visit the great condottiere, count Carmignuola, then captain general of the Milanese army, who was born in 1390 and died at Venice on May 5, 1432.[15] He comes down to a much later date when he states that in the Jubilee year of 1450 the *aux* of the sun was in the first degree of Cancer.[16] A reference to 1536 as the present year which occurs early in the work[17] seems to have been inserted by Azalus, but it is exceptional.

Such passages as we have been listing are both too numerous, too disseminated throughout the work, and in some cases too closely associated with the opening of chapters, to make it possible to account for them on the theory that Azalus might have crudely stitched together excerpts from another author or authors without expunging anachronistic personal allusions. Moreover, they are all evidently by one and the same person, whose connection is with Venice rather than Piacenza and whose period is the first half of the fifteenth rather than of the sixteenth century. Finally, it is clear from a reading of the text that it is not a medley or adaptation of one author's work by another, but all in one style and from one pen. To all appearances a work which faithfully reflects the thought and conditions of the middle of the fifteenth century has been printed unchanged in the middle of the next century.

Either, then, the dedication of Pompilius Azalus, by some slip of the printer, was attached to the wrong text and table of contents, or Azalus, despite his professed abhorrence of plagiarism,

torque cuiusdam instrumenti quod speculum planetarum appellavit anno domini MCCCCXVI arbitratus est solem epiciclum habere sed non deferentem cum ille sibi supplere videatur locum deferentis. Sed hanc oppinionem non intendo in praesenti ventilare alias fortasse dabitur tempus quo efficacissimis rationibus falsam esse monstrabimus."

[15] *Ibid.*, fol. 130v.

[16] *Ibid.*, fol. 39v: "Ad principale redeundo propositum dicimus quod anno gratiae millesimo quadringentesimo quinquagesimo quo Iubileum celebravimus inventa est aux solis esse in gradu primo Cancri."

[17] *Ibid.*, fol. 6v. The same passage gives the number of years since creation as 6754 and the years between the birth of Christ and creation as about 5200. Birkenmajer, *op. cit.*, pp. 51-52, thinks that the number was originally 6654 which would give 1454 as the year of writing.

made a most bare-faced and inept attempt to pass off as his own labor and the sweat of his brow a work which is manifestly not his own. Perhaps he thought that Charles the Fifth would never look at the book anyway. Perhaps he even failed to examine it at all closely himself. But we do not greatly care what Azalus thought or did. We are more concerned about restoring to the fifteenth century author the work which should have long since been placed to his credit. Who was this citizen of Venice, this pupil and friend of so celebrated a trio in early fifteenth century learning as Blasius of Parma, Prosdocimo de' Beldomandi, and Paul of Venice? He himself gives us the clue by referring to other writings of his. He had written on artificial fountains and aqueducts. He had addressed a treatise on perspective in painting to the Venetian painter, Iacopo Bellini,[18] father of Gentile and Giovanni who also were artists and died in 1507 and 1516. He had composed a work on the solid sphere and another on a most novel instrument, *De trigono balistario*.[19] This last title is decisive. Our author is no other than Giovanni da Fontana, hitherto chiefly known as a Venetian writer of the fifteenth century upon military and hydraulic engineering. His *De trigono balistario* is a long work on the measurement of altitudes and latitudes with descriptions and figures of the instruments employed. It was written in 1440, when he was municipal physician of Udine, and was finished on the last day of February.[20]

[18] Edition of 1544, fol. 74v (III, 14): "Ab hac naturali experientia ars pictoria optimos canones accepit, ut in libello ad Iacobum Bellinum Venetum pictorem insignem certe descripsi." *Ibid.*, fol. 83v (III, 25): "In libello de artificialibus fontibus et aquarum ductibus patefecimus."

[19] *Ibid.*, fol. 36r: "Ego similiter cum quendam tractatum de sphaera solida componerem et aliud de trigono balistario instrumento novissimo in similes errores incidi sequens Alfonsi canones et aliorum vestigia."

[20] BL Canon. Misc. 47, paper, quarto, 223 leaves: described further in a note to *Isis*, XIV (1930), 221-222. I cannot agree with Birkenmajer, *op. cit.*, p. 36, that "in Utino die ultimo Februarii per Iohannem Fontanam Venetum physicum medicum eodem in loco salariatum . . ." means that Fontana was municipal physician of Venice rather than Udine. *Venetum* is an adjective and *eodem in loco* clearly should refer to the noun, *Utino*. Both are in the same ablative case and in apposition. The passage quoted by Birkenmajer,

Von Romocki in his history of explosives has analyzed Fontana's album on military engineering with Latin explanations of its figures written in cipher.[21] In this work, which bears no date, Fontana cited other writings of his: a book on labyrinths, another on aqueducts, and a treatise on fish, bird, and hare (*Libellus de laberintis, Libellus de aquae ductibus, Tractatus de pisce ave et lepore*). The last-named title may probably be identified with a treatise concerning fish, dog, and bird, which "the most learned doctor of arts and medicine, master John Fontana of Venice, edited and noted while yet a youth." It is not a work on zoology or sport but on methods of measuring plane surfaces, depths of water, and altitudes of air by means of these three mechanical or pyrotechnic animals aided by clocks. Its more correct title is *Metrologum de pisce cane et volucre.*[22] In the same manuscript are other works by him on an hour-glass, which he speaks of as "a new composition" and which therefore may be his own invention, and on a water-clock, the latter dated October 31, "MCCCCX. . . ." But these Roman numerals for the year seem incomplete. It may have been, therefore, any year between 1410 and 1449. These three treatises constitute the entire manuscript.[23] John appears to have preferred the spelling,

op. cit., p. 48, note 55, also indicates that Fontana practised medicine at Udine.

[21] S. J. von Romocki, *Geschichte der Explosivstoffe*, I (1895), 231-240. The MS is CLM 242 (cod. icon.), Bellicorum instrumentorum liber cum figuris et fictivis literis conscriptis. Concerning it see also Feldhaus, *Die Technik der Antike und des Mittelalters*, 1931, pp. 347-348. Birkenmajer, *op. cit.*, p. 41, would date it later than 1420, the approximate year suggested by Jähns and Romocki.

[22] See Appendix 43 for its chapter headings.

[23] I follow Frati's description: BU 1426 (2705), paper, 15th century, mm. 220 x 145, fols. 1-50: "Fontana Iohannes, Nova compositio horalegi quod ex pulverum casu consistit feliciter incipit et completa per famosissimum artium et medicine doctorem peritissimum d. Iohannem Fontanam de Venetiis ad Ludovicum Venetum suum"; fols. 53-75, "Horalegium aqueum quod celeberrimus artium et medicine doctor magister Iacobus (*sic*) Fontana Venetus edidit . . . / . . . Explicit quedam horalegi per motum aquarum compositio edita per clarissimum artium et medicine doctorem magistrum Iacobum Fontanam Venetum perfecta M CCCC X . . . die ultima octobris"; fols. 85-105, "Incipit tractatus de pisce cane et volucre quem doctissimus artium et medicine doctor magister Iohannes Fontana Venetus cum adhuc adolescens esset edidit et notavit." This is the MS, then in the library of S. Salvatore, Bologna, described by Tiraboschi, *Storia della letteratura italiana*, VI, ii (1784), 461-462; ed. of 1824, VI, iii, 1750.

horalegium, for a clock. Such works show that, like the earlier de Dondis, he added to medical skill an inventive and mechanical genius. Yet he was also interested to write a general treatise on all natural things.

The records of the university of Padua substantiate the implications of the author of the *Liber de omnibus rebus naturalibus* that he studied there under Blasius of Parma, Paul of Venice, and Prosdocimo de' Beldomandi. For among those present on May 26, 1417, at examinations for the licentiate and doctorate was "master John, son of Michael de la Fontana of Venice."[24] This indicates that Giovanni da Fontana was a Venetian by birth. His own licentiate and doctorate in arts are dated June 18 and 19, 1418.[25] From July seventh of the same year to April 6, 1419, his name appears frequently as rector of the "artists."[26] On May 17, 1421, came his examination for the licentiate in medicine.[27] To the various cities of northern Italy with which we have already seen Fontana associated must be added Bologna, for he tells us himself in his work on instruments of war that he had seen there an alchemical furnace of peculiar construction.[28]

Quetif and Echard stated in the early eighteenth century that a John Fontana of Piacenza had written about 1420 a moralizing work (*Opus in quo multa moralia*) somewhat resembling the *Speculum historiale* of Vincent of Beauvais.[29] Since Azalus is described as of Piacenza in the edition of 1544, it may be that Quetif and Echard's reference represents a confused recol-

[24] Caspar Zonta et Iohannes Brotto, *Acta graduum academicorum gymnasii Patavini ab anno MCCCCVI ad annum MCCCCL*, Padua, 1922, Item No. 418.

[25] *Ibid.*, Nos. 471-472.

[26] *Ibid.*, consult index.

[27] *Ibid.*, No. 554.

[28] S. J. von Romocki, *op. cit.*, I, 232; Birkenmajer, *op. cit.*, p. 36.

[29] *Scriptores ordinis praedicatorum*, Paris, 1719-1721, 2 vols., I, 772. Birkenmajer, *op. cit.*, p. 35, has rather misunderstood my position with regard to this passage. I of course do not have the faintest notion that our Giovanni da Fontana was a Dominican or of Piacenza rather than Venice. It may be noted incidentally that a Ludovicus de Fontana of Piacenza in 1434 received the licentiate in canon law at Padua: Zonta et Brotto, *Acta graduum academicorum gymnasii Patavini*, Padua, 1922, No. 985.

lection of Fontana's *Liber de omnibus rebus naturalibus,* although it is scarcely a moralizing work and resembles the *Speculum naturale* of Vincent of Beauvais more than his *Speculum historiale.*

To a considerable extent Fontana's book is, like other medieval natural encyclopedias or general treatments of nature, a summary of existing knowledge with little in the way of innovation or departure from accepted theory. Thus he begins by discussing the duration and ages of the world, the process of creation in six days, the divisions of the universe. We shall not repeat his exposition of the heavens and inferior elements and compounds where it resembles previous works but confine our attention to less usual passages or those that offer some difference of opinion.

Explaining that the center of the universe is earth's natural place, Fontana attacks the doctrine, which is more akin to the Newtonian gravitation hypothesis than is his own, that the heavens exert a force upon the earth like that of the magnet upon iron, and that, since the earth is equally attracted from every direction, it remains suspended in the center.[30] This was the view, although Fontana does not say so, which Averroes had set forth in his commentary on the fourth book of the *Meteorology* and which in his commentary on the third book of *De coelo et mundo* he ascribed to Alexander. Fontana argues that the most noble heavens should rather spurn and repel than attract our very vile earth, and that, if there were any such attraction, all loose dust would be removed from the earth's surface, nay more our entire globe would be torn apart.

In discussing the functions and capacities of demons and angels, Fontana uses the term *incubus* in the sense of a goblin[31] rather than in its usual specific connotation in connection with the question whether demons are capable of sexual intercourse. He speaks of experience as "mistress of all and more certain than reasons."[32] The conception of man as microcosm is applied

[30] Edition of 1544, fol. 10v.
[31] *Ibid.,* fol. 16v.
[32] *Ibid.,* fol. 20v.

by him more particularly to the human head. The cranium corresponds to the primum mobile, the brain to the sphere of the fixed stars, the right eye to the sun, the left eye to the moon, the two ears to Jupiter and Mars, the nostrils to Mercury and Venus, and the mouth to Saturn.[33] The star of Bethlehem was neither a true star nor a comet nor a bit of superior fire, for such fire is invisible, but was either a special divine creation from nothing or formed by God from elemental matter in the air near the earth.[34] By the advice of sages kings house their armies in tents covered with skins of sea-calves to preserve them from lightning, and the magi instruct us to sprinkle our faces with water as soon as we see the first flash of lightning, "since they judge water hostile to flames."[35]

One of the most interesting features of the *Liber de omnibus rebus naturalibus* is the geographical knowledge or conjecture which it displays at a time nearly half a century prior to the voyages of Columbus and Vasco da Gama. This is so considerable that a recent sales catalogue, deceived by the supposition that the work was really composed under Charles V, interprets two passages as allusions to America.[36] But the *terra incognita* to which Giovanni da Fontana refers was neither South nor North America, continents which at that date lay entirely outside his ken. He held rather that the Indian Ocean, as we call it, was landlocked, being bounded on the north by India, on the west by Africa or Ethiopia, on the east and south by unknown land which, however, was in part accessible and through which there was perhaps a passage.[37] He accepted the common theory that

[33] *Ibid.,* fol. 66r.
[34] *Ibid.,* fol. 68r-v (III, 1).
[35] *Ibid.,* fol. 72v (III, 10).
[36] "Deux passages se rapportant à l'Amérique se trouvent au feuillet 94: "Et ab eius occasu finitur pro parte etiam terra incognita etc." et au feuillet 95: "Unde ex tribus maximis totius orbius (*sic*) partibus asia coniungitur africae per dorsum arabiae, quem nostrum mare Mediterraneum ab arabico excludit praeterea per terram incognitam quae indicum pelagum cingit terminatur etc."
[37] Edition of 1544, fol. 79r (III, 18): "mare Indicum quod est in latere orientali australi interclusum ex parte sua septentrionali terra Indica et occidentali terra Ethiopica, ex oriente vero et austro terra incognita est pro parte accessibili. De quo nostri ferunt manifestum hostium non habere, sed nos credimus illud habere et aditum esse ad oceanum vel brachium Amphitritis meridionale sed fortasse hominibus ignotum."

there were two chief seas: one the ocean which encircles all the land, the other a sea surrounded by land or the Mediterranean. Only he did not attempt to restrict the second conception to the Mediterranean Sea between Europe and Africa, and between the Straits of Gibraltar and Syria. For him the midland sea was manifold, and the aforesaid Mare Indicum or Arabicum was its greatest member or manifestation.[38] Just as the western Mediterranean had an irregular coastline and was studded with islands, so the Indian Sea had its gulfs and islands, many of which were inhabited.[39]

Such knowledge of the Indian Ocean of course was not unique with Fontana. About the year 1300, Bernard of Verdun, in the section of his *Tractatus optimus super totam astrologiam* devoted to cosmography, had discussed the different arms and numerous islands of the Indian Sea, stating that the greatest of these islands in its remoter part had a circumference of three thousand miles—an allusion, it would seem, to Borneo or Australia.[40] Bernard had also spoken of islands in the western ocean, using words which seem Arabic in his description and so probably employing some Arabic source, directly or indirectly.[41] But in the time of Bernard of Verdun and Marco Polo and of translation from the Arabic there was perhaps greater knowledge of the far east than in the first half of the fifteenth century, when Arabic science had long since been declining and contacts with the orient were less frequent. Fontana therefore seems noteworthy among his contemporaries.

Nor did Fontana believe that the southern temperate zone was uninhabited. In his first book, it is true, he set forth the common view in the fourteenth and fifteenth centuries that part

[38] *Idem,* "multiplex est et maximum eorum proprie dicitur mare Indicum."

[39] *Ibid.,* fol. 94v, "Non aliter dicimus de mari Indico, omne enim cum suis sinibus arabico persico gargetico eoque qui dicitur proprio nomine magnus sinus a terra similiter ex omni parte clauditur."

[40] BN 7333, fols. 12v, col. 2–13v, col. 1, cap. 4.

[41] *Ibid.,* fol. 12, col. 1, "Capitulum tertium de quantitate terre inhabitate earum insularum que habitantur alchalidet appellatis que sunt in oceano occidentali et sunt 6 numero usque ad extremam habitationem Arin terminos ceperunt in quo 12 horarum spatium invenerunt. . . ."

of the earth was not covered by water because the earth had two centers, one of magnitude, the other of gravity, and so in part projects beyond the sphere of water.[42] The converse of this view would have to be that the opposite hemisphere of the earth must be so much the more deeply submerged. But in a later book Fontana tells us that recent cosmographers, and especially those who owe their information to true experience and distant travel and diligent navigation, have found beyond the equinoctial circle to the south a notable habitable region not covered by water and many famous islands.[43] From such regions and islands came pearls, silk, and other precious articles of merchandise.[44] Although Fontana retained the traditional division of the habitable world into seven climes as a matter of customary convenience, he was careful to explain that many inhabited regions and cities lay outside and beyond these zones.[45]

How shall we reconcile these statements of Fontana? If, despite his acceptance of the doctrine that more than half of the earth's surface must be under water, because of the greater weight of the element earth, he recognized the existence of land in the southern as well as the northern hemisphere, then it would seem that he must have held that the western hemisphere was entirely covered by the ocean. Thus he affirms that it should be

[42] Edition of 1544, fol. 11r, I, 10: "de quatuor elementorum sphaeris et caeli, et quomodo pars terrae remanet ab aqua discooperta"; fol. 11v, cap. 14 (*sic*): "de vero situ terrae secundum centrum et cur secundum potestatem sit discooperta ab aqua." Under this heading we read, "Duplex esse centrum in aliquo elemento, unum magnitudinis, alterum gravitatis."

[43] *Ibid.,* fol. 90r: "Sed qui successerunt cosmographi et proprie qui vera experientia et peragratione itinerum et diligenti navigatione certiores facti sunt invenerunt ultra circulum equinoctiali suppositum versus Austrum esse partem notabilem habitabilem ab aqua discooperta(m) et insulas multas atque famosas."

[44] *Idem,* "Nec est omnino illa zona inter torridam et extremam Australem inhabitabilis ex quibus insulis et partibus ad nos deferuntur optimata omnis fere generis et margaritae gemmae pulcherrimae et sericum et multa pretiosa." It is of course possible that this passage is a sixteenth century interpolation.

[45] *Ibid.,* fol. 96r: "Post vero multa secula multae gentes incoluerunt partes plurimas extra climata praedicta et fabricate sunt civitates innumere et notae factae sunt et famosae ita ut non tantum ex climate septimo versus septemtrionalem sed ultra primum sub equinoctiali et ultra, ut ante intellexisti, de quibus multa narrantur in cronicis et historiis gesta memoriae digna."

believed that there is not any of the zones containing land which is not covered by water and uninhabitable for about half its longitude.[46]

This is a very significant passage and shows that the bearing of this Aristotelian doctrine of heavy and light as applied to the spheres of earth and water has not been realized with reference to the problem of sailing west and the voyage of Columbus. From what Fontana says it is evident that the Venetians of the middle of the fifteenth century had considerable knowledge of the Indian Ocean and adjoining regions south of the equator. But this very establishing of the existence of habitable land in the southern hemisphere would make a scientist of the time, who held the general belief that earth was heavier than water and that the sphere of earth was surrounded by a sphere of water, the more inclined to believe that there was no land in the western hemisphere. Such a scientist would discourage his fellow Italians from westward enterprises, and possibly the Portuguese, when they found that the west coast of Africa extended south of the equator, would take the same view, although their discovery of islands out in the Atlantic would have a corrective effect. Empirical observations of fishermen and traders might lead to new truth, but the accepted scientific hypothesis tended to discourage discovery. And this raises the serious question whether scientific hypotheses, although highly esteemed by many, do not, like historical generalizations, tend to accomplish more harm than good. What we need are more facts, to find a few more islands in the ocean of mystery.

Whence did Fontana obtain his knowledge of distant lands? Probably it was in large measure due to his connection with Venice, the great trading power of the time. He has much to say about the Great Khan, and uses the works of thirteenth century travelers like Marco Polo and Odoric, or more recent writers like John Anglicus (Mandeville?) and Nicholas of Venice (Niccolò

[46] *Ibid.*, fol. 90r: "Et credendum est quod non sit aliqua ex zonis predictis terrae quae secundum fere medietatem longitudinis eius non sit ab aqua cooperta et inhabitabilis."

Conti?). A less familiar contemporary named by him is Constantine of Venice, a faithful friend of his who had traveled for many years through the empire of the Great Khan.[47] Sometimes such friends regaled him with tales of doubtful veracity. He heard from many merchants who were dear friends of his "and trustworthy" that they had seen in the river Tanais (Don?) and in other streams of Asia aquatic animals which seemed human in form but were really fish.[48] To investigate whether deep sea water was sweet he had constructed a vase for the Venetian patrician, Marco Lippomano, to drop overboard, but it was never tried out.[49] Despite his knowledge of the earth's surface, he held to the belief that hell was situated within the earth.[50] Those who expressed doubt as to tales of other lands and gave themselves neither to study nor travel he chided as idle stay-at-homes, like an ass in its stable or a cow nourished in a courtyard. The best way for such a person to discover his ignorance would be to pay a brief visit to some adjoining region.

> And most assuredly he will find there some differences and novelties, either in the idioms of the language, or in human *mores,* or in the manner of living or costume, or in the arts and crafts, or in variety of plants or fruits or birds and beasts differing from his own province.[51]

And how much more is this the case with a really distant land.

Very different was the attitude of the contemporary John Calderia in his *Book of the Canons of Astrology and Description of the Whole World,* addressed to Alfonso V, king of Aragon.[52]

[47] *Ibid.*, fol. 119r, "Constantinus Venetus mihi fidelis amicus qui plurimis annis per regna magni kan peragravit multa similia se vidisse retulit."

[48] *Ibid.*, fol. 125v, "Audivi a multis mercatoribus amicis meis carioribus et fide dignis se vidisse in Tanay flumine. . . ."

[49] *Ibid.*, fol. 81v (III, 19).

[50] *Ibid.*, fol. 83v.

[51] *Ibid.*, fol. 142v (the last page of the work): "Si quis talium voluerit suam cognoscere ignorantiam, parum per se a domo discedat et ad aliquam proximam transferat regionem. Et certissime inveniet ibi aliquas differentias et novitates vel in linguarum idiomate vel in moribus hominum vel in modo vivendi vel in habitu corporis vel in artificiis et operibus vel in herbarum diversitatibus vel fructuum vel in volatilium aut quadrupedum differentia aliter quam in propria provincia."

[52] Venice, S. Marco XX, 95 (Valentinelli, XI, 93), fols. 41-129, Ioannes Calderia Venetus, Liber canonum astrologiae ac totius orbis descriptione (*sic*) ad Alphonsum inclytum regem Aragonum. It opens, "Quamvis preclare multa tam

Yet he was a Venetian also and had presumably the same opportunities as Giovanni da Fontana to learn of distant regions from the merchants and sailors of that city. Since Alfonso became king of Naples in 1442, Calderia's work was probably written before that date, and so a few years before that of Giovanni da Fontana. John Calderia had delivered various academic orations at Padua in 1423-1424 and was very old when he died in 1474.[53] To assist in the education of his daughter he composed an exposition of the Latin school-book known as Cato.[54] Although a physician, his writings tended to run in certain grooves of fifteenth century Italian humanism, with some effort to reconcile the literary and moral interests of humanism with theology. He wrote on moral and theological virtues,[55] on the excellence of the Venetian constitution and culture,[56] and on the agreement of poets, philosophers, and theologians.[57] The last named work is a tiresome hodge-podge and spiritless compilation couched in very long sentences which express only trite and elementary ideas.[58] It shows much the same interest in the stars as the *Liber canonum astrologiae,* taking up "the varied traditions of the poets" for each planet in turn.[59] It seems evident that John Calderia, the Venetian physician, had a much less curious and inventive mind than Giovanni da Fontana, and we there-

a philosophantibus tam etiam ab astrologis. . . ." The discussion as to which parts of the globe are inhabitable occurs in the last two chapters of the first book beginning respectively, at fols. 54r and 55v, I, 8, "De totius terre divisione suisque habitabilibus et inhabitabilibus partibus"; I, 9, "De totius terre divisione et que ad habitandum que nientiora (?) loca sint."

[53] Agostini, *Scrittori veneziani,* Venice, 1752-1754, II, 411-419.

[54] Agostini mentioned a MS of it in the archiepiscopal seminary at Padua.

[55] BL Laud. Misc. 846.

[56] *De praestantia Venetae politiae.*

[57] *Concordantia poetarum philosophorum et theologorum Joanne Calderia phisico authore opus vere aureum quod nunc primum in lucem prodiit ex antiquo exemplari authoris,* Venetiis apud Cominum de Tridino Montisferrati, 1547, small octavo, 179 fols.

[58] As a small sample of its style and argument may be given the opening sentence of the section (fol. 137), "De inquisitione liberalium disciplinarum Ioannis Calderiae liber secundus prohemiale capitulum: Quamvis multa et quidem praeclara seniores illi vates nobis tradidissent, multo plura a sacrarum literarum scriptoribus vera minusque ficta suscepimus."

[59] *Concordantia* ed. 1547, fol. 81 *et seq.*

fore are not much surprised to find his cosmography more backward.

The text of the *Liber canonum astrologiae* as a whole breaks off incomplete in the midst of the eighth chapter of the fourth book.[60] A table of contents[61] shows that the remaining six books would have treated of astrological interrogations, elections, revolutions, and nativities, "of the parts of astronomy which the Gentiles used," such as nigromancy, hydromancy, aerimancy, pyromancy, geomancy, and chiromancy, and of a geographical account of particular places. John Calderia was indeed aware that Peter of Abano reported that Marco Polo had gone south of the equator, but although he regards Peter of Abano as "the most outstanding of all philosophers," he marvels that so great a man should have made such a mistake.[62] John will show by natural reasons that Abano was wrong. He argues that it is hotter at the equator than in the tropics,[63] and that the short seasons there —spring, summer, autumn, and winter each occurring twice a year—are too brief to permit the raising of crops.[64] Arin, from which latitude and longitude are reckoned, is an imaginary city on the equator, not a real habitation.[65] The abode of the first man, Adam, was not near the equator but in the neighborhood of Damascus.[66]

John Calderia is further aware that some philosophers have held that the southern temperate zone is habitable, but for him it is covered with water and utterly uninhabited.[67] He repeats the stock astrological argument that the influence of the stars is weaker there, and that the signs of the zodiac are less fortunate. "Therefore the south is of a necessity sterile, morbid, and pestiferous; the north, fruitful, jocund, and most healthful."[68] This is further demonstrated by the nature of south winds.[69] The

[60] S. Marco XX, 95 (Valentinelli, XI, 93), fol. 129r.

[61] *Ibid.,* fol. 61r, col. 2.

[62] *Ibid.,* fols. 56r, col. 2-56v, col. 2.

[63] *Ibid.,* fol. 57r, col. 1.

[64] *Ibid.,* fol. 57v, col. 1.

[65] *Idem.*

[66] *Ibid.,* fol. 57v, col. 2.

[67] *Ibid.,* fol. 58r, col. 1.

[68] *Ibid.,* fol. 58r, col. 2.

[69] *Ibid.,* fol. 58v, col. 1.

south pole is much worse for habitation than the north because the humidity from the north settles there and induces corruption. Men there are savage, brutal, without religion, and often cannibals, and there is a multitude of spirits and demons there.[70] Since John has asserted that both frigid zones are uninhabited[71] and likewise the entire southern hemisphere, these allusions to savages and to the south pole being worse for habitation than the north seem contradictory or inconsistent. Probably the meaning is that the farther south one goes, the more savage peoples one encounters and the less favorable conditions for life. To account for the existence of dry land in the northern hemisphere it is explained that the water flows continually to the south. Astrologers believe that while there may be a continual conversion of air into water in the north, yet certain stars near the north pole hold the waters and prevent their submerging the dry land. Certain philosophers give the different explanation that the dryness of the earth contains the waters—perhaps in subterranean caverns, but sacred writers regard it as a divine miracle performed in order to render life on the earth possible. In reality such resort to divine miracle is only in order to save an incorrect natural theory of the elements, of heavy and light, and of a geocentric universe. The sacred writers do not credit their creator with a plan of things consistent with the development of life on earth, but with an inadequate original design which requires constant miraculous intervention to make dry land and life thereon possible.

So much concerning the work of John Calderia. Since its contents, so far as they are contained in the St. Mark's manuscript, appear in other respects to vary little from other medieval works of cosmography and astrology, I shall merely reproduce the book and chapter headings in an appendix. We return to consideration of the book of Giovanni da Fontana.

Giovanni da Fontana was proud of the improved knowledge of the weather and of the map-making of his age. Prevailing

[70] *Ibid.*, fol. 56r, col. 1.

[71] *Ibid.*, fol. 55v, col. 2.

winds, islands, promontories, gulfs, rocks, shoals had all been charted.[72] This is a noteworthy literary reference to the excellence of the portolan charts which sailors of the Mediterranean had been using and making since at least 1300. Fontana also was proud of the mechanical progress and invention of the later medieval period, and spoke of almost the entire habitable world being full of magnificent fabrics, ingenious machines, and organic instruments for carrying on the arts or operative sciences.[73] From this it is something of a descent to the old story of remedies learned from observing animals heal themselves therewith. Despite the fact that Fontana was himself the author of an illustrated work on instruments of war, he represents as the invention "of impiety no less than genius . . . the horrid machine which we call a *bombarda*." But he marvels that so much force is generated by a weak powder.[74]

Interesting, if true, are some of Fontana's statements and anecdotes concerning his own times. A "trustworthy" person had told him that when he attended the university of Paris, it had fifty thousand students and more than sixteen thousand colleges and boarding-houses.[75] When on the mission to Carmignuola, he heard rustics tell of men who ate the little children of their

[72] Edition of 1544, III, 7 (the numbering of the folios here becomes a little confused): "Navigantes autem cautiores facti et experti multa naufragia atque maris pericula evaserunt (cum facile sit inventis agere et superfactis consulere) ventorumque ortus et differentias adiunxerunt et nostris etiam temporibus communiter observatur. . . . Igitur multiplicantes situs et aspectus ventorum ad loca quaecumque maritima precisius atque tutius navigant per illos signantes insulas promontoria sinus scopulos siccas subaqueas et ripareas ut quae voluerint accedere vel evitare facile possint. Gaudent enim naucleri et portulani ventorum plurimum in suis mappis vel cartis et stellis nauticis descripta. Paucitate vero eorum antiquitus formidabant et saepius periclitabantur in mari."

[73] *Ibid.*, fol. 110v, "Totus enim fere habitabilis orbis fabricis illustratur magnificis, ingeniosis machinis plenus est et *organicis instrumentis de quibus* scientiae operativae quae artes vocamus."

[74] *Ibid.*, fol. 111v, "Ex quibus est orrida machina quam bombardam appellamus ad diruendam omnem fortem duritiem etiam marmoream turrem non minus impietatis quam ingenii fuisse existimo qui primo adinvenerit . . . tantam vim habeat a pusillo pulvere." See fol. 22r (I, 22) for another passage on the force of gunpowder.

[75] *Ibid.*, fol. 112r, "Audivi a fide digno quod cum ibidem esset etiam illo tunc temporis in illius studio scolares erant quinquaginta millia et plusquam sexdecim millia hospitium (*sic*) collegia."

enemies.[76] A Venetian left orders that he be buried in the wall, and a man at Padua, while Fontana was a student there, insisted upon burial with joy and gladness rather than mourning.[77] When Venice during a war ran short of gold and silver, the government stamped leather and ordered it to be accepted as legal tender for a few days, when gold and silver would again be given in exchange.[78]

Besides those late medieval writers who had been his own friends or teachers, like Blasius of Parma, Paul of Venice, and Prosdocimo de' Beldomandi, Fontana cites such names from the preceding century as Giovanni de' Dondi, John de Lineriis,[79] and Peter of Abano. The theory of Arzachel (Al-Zarkali) and Thebit of access and recess to explain the movement of the eighth sphere was in Fontana's opinion a subtle invention which avoided the necessity of a vacuum or the penetration of one body by another. King Alfonso followed it in his Tables, and John de Dondis and many others observe it at present. But Fontana prefers to it the explanation given by Peter of Abano in his *Lucidator* and treatise on the movement of the eighth sphere.[80] He mentions 1310 as the date of these two treatises which is, indeed, the date given in their texts. Fontana also accepts Peter of Abano's astrological doctrine of alternating periods of advance and decline in civilization as the movable and immovable zodiacs of the eighth and ninth spheres coincide and separate.[81] Reference is made to a student of perspective who had stated that the utmost radius of a rainbow was forty-four degrees, and that

[76] *Ibid.*, fol. 130v.
[77] *Ibid.*, fols. 133v-134r.
[78] *Ibid.*, fol. 136r.
[79] *Ibid.*, fol. 35v, "Ioannes de Lineriis quamvis acutus arismetra. . . ."
[80] *Ibid.*, fol. 34v: ". . . hanc sequutus est rex Alfonsus in suis tabulis et multi antiquorum tabulistarum et Ioannes de Dondis Patavius et plurimi hodiernis temporibus observant sed non legerunt opinionem quam veram iudicamus quae fuit Petri physici medici et in arte astrorum clarissimi sive ex proprio ingenio sive ab alio accepit in suo lucidario astrologico eam ponit atque particularem tractatum de motu octavae descripsit quem ad propositum ordinavit per efficacissimas rationes naturales et verissimas experientias reprobans omnes opiniones eorum qui tales motus accessus et recessus cum reiteratione eorum crediderunt."
[81] *Ibid.*, fol. 36r-v.

therefore a rainbow could not be seen when the sun was more than forty-four degrees above the horizon.[82] But his name is not given. The opinion expressed sounds like a perversion of that which we noted in a treatise on perspective ascribed to Henry of Hesse. Fontana repeats the comparison of the universe to a mechanical clock which God had set running, which we find in writers like Nicolas Oresme of the fourteenth century who accepted Jean Buridan's theory of impetus. Fontana himself does not go quite that far but retains the blessed angels as moving intelligences.[83]

John of Sacrobosco is criticized for having held that a lunar eclipse could never be visible throughout the inhabited region of the globe.[84] But Fontana agrees with him that the eclipse of the sun at the time of the crucifixion could not have been natural for the reason that the moon was then in its fourteenth day and beneath the horizon in the southern hemisphere in opposition to the sun, and so could not interpose between sun and earth.[85] Michael Scot and Albertus Magnus are other thirteenth century authors cited, and that for such incredible stories as those of men with three eyes or of the men of India or Ireland who grow so old that they ask to be taken to some less salubrious climate in order to be able to die at last.[86]

Not only did Fontana affirm that God had entrusted to angels the task of running the clock of the world; he also displayed an inclination towards that type of astrological necromancy which there is some reason to suspect had brought Cecco d'Ascoli to the stake, and towards *Ars notoria* which was often condemned by the orthodox as a forbidden occult art. In a chapter on the blessed angels who dwell in the twelve signs of the zodiac he states that the first makes a man perfect in his life with no fear

[82] *Ibid.*, fol. 75v (III, 14).
[83] *Ibid.*, fol. 41r (II, 9): "O mirabilis sapientia divina quod tam nobile horologium aedificavit et mirabiliter moveri iussit per benedictos angelos ministros suos!" See also fol. 13r (I, 12).
[84] *Ibid.*, fol. 59v (II, 33).
[85] *Ibid.*, fol. 59v (II, 37). This page occurs two leaves later than that of the same number mentioned in the previous note, fols. 59r-60v being repeated.
[86] *Ibid.*, fols. 117v, 140v; see also the story from Albertus at fol. 124v.

of damnation; the second, which has a form like a child of three years, enriches men; the third confers power over brothers and kindred and floods; and so on.[87] Exorcists are able to summon these spirits, one of whom has the form of a dove bearing a crown of twelve precious gems on his head and in his mouth a green laurel leaf folded in the sign of the cross. This angel instructs one in geomancy, theology, and mathematical science. The spirit or spirits of the ninth sign or Altitude are able to transport men very swiftly from province to province. Blessed is the man who rises to such merit that he can call and converse with such spirits. "Nor think, my son, that this is impossible or a fable of the poets."[88]

The notory art is concerned with the figures of good angels when they are summoned devoutly with prayers and without mortal sin. It admonishes man what sort of life he must lead in prayer and fasting, in chastity and purity of heart, in devotion and faith, and what modes and times and places he must observe, if he wishes to summon to himself some angel from those blessed Intelligences. If they appear to wicked men, it is only to deceive them, but they are coerced by holy exorcists through the virtue of God. Although sometimes they are coerced by philosophers and students of the arts, they do not appear because of the sanctity of such persons' lives but because of their faith and the virtue of the characters and divine names which they employ, which we believe God revealed to Adam while he was still in a state of innocence, and which Adam afterward communicated to his sons. Such sacred characters and names of good angels Fontana regards as of great efficacy. But they have often been corrupted by the ignorant. Fontana himself had learned from a demon how to congeal mercury.[89]

Although stars are lacking in the ninth sphere, the sages say

[87] *Ibid.*, fol. 66r. For the names of the angels who move the planets, fol. 17r (I, 16); on angels of the decans, fol. 32r (I, 29).

[88] *Ibid.*, fol. 66v.

[89] *Idem.* On the ars notoria and sacred characters, *ibid.*, fols. 19r, 66v, 73r. In the first of these three passages we read: "Ego autem visibiliter loquutus sum cum substantia spirituali. . . ."

that characters and outlines of images not apparent to us are present there, including the twelve signs of the zodiac and many other occult emblems of numerous properties and virtues. The astronomers of Persia and India even say that some of these can be seen by very keen vision at certain seasons on very clear and quiet nights from mountain tops and by those to whom it is conceded or revealed. They attribute these characters to the angels of the spheres of the planets and the stars. Experimenters engrave such characters or names of angels and constellations on metals, or make seals in wax or gum, or paint images of various forms and materials. Hermes, Enoch, Toc, Aaron, Evax, Salimananchus, Zeno, Zael, Ptolemy and many Greeks were authorities concerning such images and wrote on the *ars notoria*.

And we read that in the region of the damned are found characters and infernal figures and names of the chief devils for forming images to promote lust, discord, secret homicide, to spread disease,

and for other bad ends. Not good angels but astute devils revealed them to men in the abominable art of magic. Many are found in writings on fascination, among the authors of which Fontana names Virgil and Peter of Abano. God forbids the manufacture of such images, but sorcerers employ them.[90] Some persons think that those images which work against poisons, diseases, fire, thunderbolts, and other ills, or which confer wisdom, eloquence, and concord are not to be condemned but have an astrological and natural basis and were revealed to men by angels as remedies. But Fontana concludes that it is safer to omit both kinds since they are hard to distinguish.[91] Some pages later he states that some believe that the names of the mansions of the moon are those of angels deputed to those places, for each mansion has its own characters and peculiar influence, and ex-

[90] *Ibid.*, fol. 26r, "has fieri semper prohibuit Deus sed iubent malefici." The preceding discussion occurs on the same page in the chapter (I, 26), "De caracteribus sphaerae nonae et (con)stellationibus."

[91] *Idem*, "Cum vero similium characterum descriptiones variae sint et pictorum errore atque scriptorum corruptae habeantur et ad corrigendum nullam regulam invenio."

perimenters are wont to form images or to begin new undertakings when any planet, but more especially the moon, enters them.[92] Thus experimenting is connected a second time with magic and occult arts. But Fontana warns his son to have nothing to do with these arts which the church prohibits.[93] Anent pyromancy he remarks in another passage that certain *Piromantici,* who wish to make prognostications from haloes and other appearances of colors of that sort, incorrectly assume that they are in the sky.[94] He alludes to certain activities of the alchemists without expressing disapproval, as when he speaks of their artificial waters or their producing flames of different colors.[95] He mentions the vulgar notion that the size of the vintage, and of the grain and olive crops can be predicted from the colors of the rainbow, but leaves it to others to determine whether this be true.[96]

Such is the combination of science and superstition, of credulity and correct information in the *Liber de omnibus rebus naturalibus*. We next turn to one or two other treatises with which the name of Giovanni da Fontana may be associated.

The *Metrologum de pisce cane et volucre,* although said to have been composed by Fontana in his adolescence, was not his first work. It follows two other treatises by him on water clocks and sand hour-glasses in the Bologna manuscript, and it seems to cite them and perhaps other early writings.[97] It associates magical illusion with experimentation and mechanical ingenuity and with methods of more exact measurement both of time and of motion in space. Fontana is interested in devising clocks which will measure brief intervals of time in contrast to those of slower movement appropriate to the courses of the heavenly bodies. These time pieces of more rapid motion would include not only

[92] *Ibid.*, fol. 33v.
[93] *Ibid.*, fol. 31v.
[94] *Ibid.*, fol. 77r (III, 17): "Qui vero alorem et huiusmodi apparentias colorum esse in coelo putant male iudicant (ut quidam Piromantici ex hiis coloribus volentes ferre pronostica) licet ibidem esse appareant."
[95] *Ibid.*, fols. 75v and 79v (III, 15 and 19). Also fol. 13v (I, 17).
[96] *Ibid.*, fol. 75r (III, 14).
[97] BU 2705, fol. 86r and 86v, "que in quibusdam tractatibus meis diffuse satis explanata sunt."

water-clocks and hour glasses but air clocks marking the escape of air from a bladder or drum and fire clocks measuring time by the consumption of a candle or burning of oil in a lamp. Fontana further believes that mechanical clocks can be made to indicate brief intervals of time and that, in addition to the wheel which makes one revolution per day, there can be others which revolve once in an hour, or minute, or second. He observes that the flow of water in a clepsydra is more even and regular than that of sand in an hour glass, since the sand does not maintain one level as the water does but makes a depression in the center and clings to the sides of the upper receptacle. Similarly it is more difficult to measure its ingress into the lower receptacle by lines drawn on the exterior since it tends to pile up there in a cone. On the other hand, he dismisses as a theoretical quibble which makes no practical difference the contention that the surface of water always tends to take the curve of a great circle of the earth and that consequently a water-clock on a mountain would not keep the same time as one in a plain. The difference in barometric pressure he of course does not consider.[98]

With such delicately adjusted time-pieces Fontana would measure previously unknown altitudes by timing the rise and fall of rockets to them and comparing these with the corresponding times for towers of known height. Or he would measure depths of water by the rising to the surface of floats which had been submerged and sunk to the bottom. Or the distance on the level would be computed from the time which an automaton or projectile took to cover it. This involves discussion of such mechanical devices as that to release the float from the lead when it touches bottom. In connection with old stories of Alexander or other men who succeeded in flying or in descending to the bottom of the sea the practical possibility of such ventures is considered. The ascent of a man in a sort of hot air balloon heated by torches held in his hands Fontana is inclined to reject as too dangerous because of the likelihood of the envelope catching fire and the impossibility of a safe descent.

[98] For his discussion see *Metrologus,* cap. 4, BU 2705, fol. 87v *et seq.*

On the other hand, he does not doubt but that artificial wings can be made by which a man can fly, although he has never had time to work the matter out.[99]

Fontana is sceptical as to the old legend of descent under the sea in a sort of bell (*veges*) open underneath but drawn down by a weight attached.[100] From daily experience of the difficulty of submerging smaller objects full of air he thinks it would be very difficult to drag to the bottom a large envelope of air, and he also advances various reasons why the air within would not be good to breathe, being either too damp from the moisture beneath, "or the man will be suffocated by excessive heat or extinguished by cold." On the other hand, he believes in devices by which divers may walk about under water and breathe freely. Incidentally he notes that any animal with lungs requires air just as a candle does to burn, but not, he holds, for the same reason although many think so.

With such invention and measurement is mixed magical illusion. Fontana had determined by a series of experiments the amounts of gunpowder necessary to elevate rockets of different weights.[101] Yet he instructs not only how to shoot a rocket into the air but how to give it the appearance of a devil or flying dragon belching fire from the mouth and leaving a stench behind. Or, in connection with a sort of torpedo or magic candle which burns under water and alternately rises and sinks as the weak and stronger powders contained in it successively burn, he tells how he once purposely deluded a monk who showed too strong a desire to understand great experiments. Fontana constructed a diabolical figure full of such chemicals that moved about under water and emitted rays of fire and frightened the monk greatly. And he composed other artificial devices at Padua

[99] BU 2705, fol. 97r-v (close of cap. 7): "Ego quidem non dubito iungi posse alas homini artificialiter actas quibus se levabit in aere et per illum se valebit transferre et turres ascendere et aquas pertransire de quo iamdudum scribere cepi et fantasiam explanare. Sed aliis distractus occupationibus non perfeci. Sunt et plures ascensus alii per cordas et scalas et quedam ingernata. Sed illa pretermitto dicturus alias cum tempus dabitur magis ydoneum."

[100] The following discussion occurs in cap. 5, BU 2705, fols. 89v-91r.

[101] BU 2705, fol. 96r, cap. 7.

which led many "very learned and sagacious men" to affirm on oath that they knew for certain that he had conjured infernal spirits from hell by nigromantic sacrifices and the force of exorcisms and seals and characters and other secret arts.[102] Thus instead of the old notion that in the middle ages any person devoted to scientific observation and experiments was sure to be unjustly suspected of magic, we find a man using his chemical and physical knowledge and mechanical ingenuity deliberately to feign magical illusions and rather boasting of the reputation for dealing with demons which he thereby acquired than fearing that it would lead to any evil consequences. His writing two of his other works in cipher[103] shows a like tendency towards the mysterious and theatrical. While it may have been due to a desire to keep certain processes secret or to enhance their value by pretending to conceal them, it can hardly have been for fear that the contents, if generally known, would involve him in persecution or accusations of magic, since he seems to have courted such a reputation. Rather the cipher would be to give the work a slightly added flavor of marvelousness and secrecy, just as the rocket was to be masked as a flying dragon or the squib as a water demon. Thus in the pages of Giovanni da Fontana we find magic and experimental science still going hand in hand.

The title, *Libellus de speculo mikesi* (for *mukefi* or parabolic),[104] is applied to an opusculum by John Fontana of Venice

[102] BU 2705, fol. 92r: "sicut et alii quamplures eciam doctissimi et sagacissimi viri crediderunt cum Padue quedam artificiosa componerem atque sophystica quibus persepe decepti fuere multis aliis hominibus affirmantes eciam proprio sacramento se scire de certo me nigromanticis sacrificiis et exorcismorum viribus de tartaro ad beneplacitum meum traxisse spiritus infernales et candelariarum pentaculorum sigillorum atque karaterarum reliquarumque secretarum artium modorum doctrinam et experientiam intellexisse."

[103] His second work in cipher, besides the *Bellicorum instrumentorum liber* already mentioned, is a *Secretum de thesauro experimentorum ymaginationis hominum*—a title associating experiments with secret treasure and imagination—in BN nouv. acq. 635: see further Birkenmajer, *op. cit.*, pp. 41-42, 50-51.

[104] *Mikesi* is my reading of the Barberini MS, though Birkenmajer, *op. cit.*, p. 38, and Björnbo, *Abhandlungen z. Gesch. d. math. Wiss.*, XIV (1902), 137, give *mukesi.*

in a Barberini manuscript both in a table of the manuscript's contents on its first leaf[105] and in the upper margin of the folio where Fontana's treatise begins,[106] but in either case in a different and later hand than that of Fontana's text. Whether properly applied to it or not, in any case this title is somewhat misleading, since the work itself, or as much of it as is given in this manuscript where it seems to break off unfinished,[107] is not concerned with mirrors or laws of perspective, but with the emergence of dry land above the sphere of water, the movement of the primum mobile and lower spheres, and the problem of epicycles and eccentrics. The second sentence of John's treatise emphasizes the importance of experimental science.[108] Proceeding to the problem of the emergence of dry land above water, when the earth as the heavier element should be enclosed by the sphere of water, John affirms that God effects this to make human life possible but naturally, not miraculously. The earth's center of gravity coincides with the center of the universe but the center of its magnitude or circumference does not. Thus a fourth of the earth's surface is uncovered by water "according to the common way of thinking." This makes the sphere of earth eccentric on its convex side and the sphere of water eccentric on its concave side. All the other surfaces of the elements are concentric with the firmament except a concave portion of the air where the dry land projects into it. The variations in grossness and rarefaction between the inferior elements make it impossible for the rays of the stars to reach us in straight lines unless they

[105] Vatican Barberini 350, fol. 1r, "Contenta in hoc volumine varia opuscula mathematica, videlicet:

Incerti Perspectiva	fol.	2
Geometriae demonstrationes quedam		20
Canones in temporibus de motibus coeli		25
Complementa mathematica Card. Cusani		43
Libellus de speculo Mikesi		61
Tabulae latitudinum planetarum		72
Tabulae Nicolai Alemanni aequationum xii domorum coeli		91

Concerning this MS see further Birkenmajer, *op cit.*, pp. 38-39.

[106] *Ibid.*, fol. 61r, "Libellus de speculo mikesi magistri Iohannis fontana Venetus. Cum inferiorum cognitio ad celestium conducat inquisitionem. . . ."

[107] *Ibid.*, fol. 65v, col. 2, ". . . Alio modo et commodius videtis."

[108] *Ibid.*, fol. 61r, col. 1, "Nam ea ex hiis que apud nos sunt velut experimentaliter apprehendimus."

fall perpendicularly on the convexities of the elements, which happens only when the stars are in the zenith of the sky. In any other situation their rays are deflected more than if the medium were uniform. Hence the stars seem more elevated above the horizon than they actually are and seem larger in size when near the horizon. The deception as to their altitudes is so great that they often vary by two degrees or more from the calculations in astronomical tables.

Fontana thinks that the lower spheres receive a second motion from the primum mobile not by contact of their surfaces but by some natural influence analogous to that of the magnet upon iron. He affirms that no point on the surface of an inferior sphere would describe a perfect circle except its poles.[109] He shows his familiarity with the late medieval conceptions of uniformity and difformity in the proposition that a sphere can be moved on its own center with such a difformity that on another point than the center it would reduce to uniformity.[110] He then proceeds to a discussion of the argument advanced against the hypotheses of eccentrics and epicycles, which, as has been said, seems to break off unfinished.

Fontana's treatise is bound in the Barberini manuscript together with a number of tracts on kindred themes but in different hands, some on membrane and others on paper. There is an anonymous treatise on perspective, some geometrical demonstrations, and various astronomical canons and tables including tables of equations of the twelve houses of the sky by a Nicholas the German (*Alemannus*). But the most noteworthy work of all is a mathematical one by Nicholas of Cusa, addressed as cardinal to pope Nicholas V in 1454.

The practically identical title, *Speculi almukesi compositio,* is given, and more appropriately, to a quite different treatise which is primarily concerned with the problem of burning mirrors.

[109] *Ibid.*, fol. 61v, cols. 1-2, "Est tamen advertendum si que spera inferior per se mota super polis propriis et influxu superiorum moveatur, nullus punctus convexitatis eius circumferentiam describeret preter polos."

[110] *Ibid.*, fol. 62r, col. 2.

The only copy of it that I have seen occurred in the same manuscript with Roger Bacon's discussion of the multiplication of species and was ascribed to him.[111] But it appears to have been composed later since it cites as a past writer Witelo, a contemporary of Roger Bacon but never cited by him. Campanus of Novara, another contemporary of Roger Bacon, is also cited as a past authority. The question that we would here raise is whether this *Speculum almukesi* is not by John Fontana as well as the astronomical treatise to which its title was incorrectly applied in the Barberini manuscript. It is especially concerned with two conclusions of Apollonius of Perga which, it says, Witelo, like all other writers on burning glasses, had assumed in his *Perspective* without proving them. Our author states that he at first proved these two conclusions false to his own satisfaction but finally came to a truer understanding of them. In order not to let his labors be lost he proposes by means of these two conclusions and others which he will prove below to show how to construct a burning glass for any distance which will be half the radius of the circle of which any part large or small may serve in forming the instrument. "And this will be the chief aim of this treatise."[112] After eight preliminary mathematical conclusions, the ninth and tenth deal directly with burning mirrors.[113] Fontana's interest in burning mirrors is attested by notes, perhaps in his own hand, on a text of Alhazen in a Paris codex described by Björnbo and Birkenmajer.[114]

[111] FL Ashburnham 957 (888), about 30 x 22 cm., with script page about 22 x 12 cm., 27 lines to a page, in a humanist hand of late 15th or early 16th century. Some letters at the end of the MS dated 1532 and 1533 are in a similar but perhaps later hand. Bacon's *De multiplicatione specierum* occupies the first 70 leaves. At fols. 95r-110v, rubric, "Speculi almukesi compositio secundum Roggerium Bacon ordinis minorum," incipit, "Quia diversorum quos de speculis ad datam distantiam comburentibus tractare perpendi seu quorum vidi tractatus in scriptis omnes et singuli duas supposuerunt conclusiones ab Apollonio Perseo allegatas . . ." The work ends, ". . . ideo presenti opusculo cum laude dei dicta sufficiant. Explicit feliciter."

[112] *Ibid.*, fol. 95v.

[113] An unnumbered conclusion follows at fol. 108v.

[114] BN 9335, fols. 88rb, 134r: Björnbo in *Bibliotheca Mathematica*, III (1902), 66, 74; Birkenmajer, *op. cit.*, pp. 39, 49-50.

Between Roger Bacon's *Multiplication of Species* and the treatise on burning mirrors of which we have just been speaking occurs a third work entitled *Protheus*.[115] The idea in this title is that as the old man of the sea constantly changed his form so water is a marvelous element which undergoes many transformations and works wonders.[116] Michael Scot's *Liber introductorius astrologiae* is cited for the notions that every man large or small resolves into a single ounce of the slime of earth from which Adam was created, and that of the four elements there is ten times as much water as earth, ten times as much air as water, and ten times as much fire as air.[117] Our treatise is especially concerned with ways to raise water from depths such as syphoning, "attraction of air," pressure, impulse, rotation of a wheel, and application of heat from various sources, with attendant expansion and contraction. A dialogue between nymphs and Proteus is attempted but soon abandoned. The usual view then that there is no vacuum in nature, is expounded, and that some other thing always follows and takes the place of what is removed, "for many things seem empty which are not." The author goes on, however, to affirm that sometimes contrary to nature there evidently is a vacuum or empty space, and he contends that were this not so in the case of water, neither light nor heat could penetrate the depths of water. He also points out that, as is written in the work of Hero *de vacuo et inani* one can blow more air through a tube into a sphere which appears to be filled with air already, or can suck out some of the air which it contains. He thinks that vacant spaces in water are the explanation why divers or swimmers at the bottom are not crushed by the weight of the water above them on their backs.

[115] FL Ashburnham 957 (888), fols. 71r-94v, "Inci[pi]t Protheus, Studiosum ut video me putatis, optime gerra, dum mihi rem tanta vetustate collapsam et a nemine resumptam in lucem quodam quasi post liminio emungitis revocandam. Faciam quidem quod potero non ideo quod me sufficientem (h)oneri credam . . . / . . . vel lapide corrigatur."

[116] *Ibid.*, fol. 71v, heading, "De admirandis aquarum"; opening words, "Mirabilium omnium que mundo congenita sunt. . . ."

[117] *Ibid.*, fols. 72v and 73v.

Archimedes on weighing liquids in liquids, Philo and Ctesibius are cited as well as Hero. Besides this discussion of ways of raising water, which suggest the title, *Libellus de aquae ductibus,* attributed to John Fontana, our text deals with such contrivances as the vessel from which one may draw wine or water at will from the same orifice, burning candles, and hydraulic organs. The last topic involves some discussion of the natures and specific weights of metals with relation to musical consonance.[118]

The author of *Protheus* is fond of quoting Vergil as well as of classical allusion and mythology. He writes at the request of someone whom he appears to address as Gerra and who has asked him to exhume this subject which he depicts as a ruin of antiquity which no one hitherto has brought to light or endeavored to restore. The author feels like an old race horse who is brought out to attempt one last course, but has some doubts as to his adequacy for the task. The chief objections to Fontana's authorship would seem to be that the humanist manner of the work is hardly his and that in its acquaintance with so many ancient physicists and otherwise it sounds as if composed later in the fifteenth century. But inasmuch as the author implies that it is written late in life, perhaps we may tentatively assign it to Fontana. If so, we probably have extant both his first and last publications as well as a goodly number of others coming in between.

Giovanni da Fontana was contemporary with two men who were not a little like him in mental outlook and inclinations and who also were both associated with Venice. There was Leonard of Bertipaglia, employed by the Venetian government as lecturer on surgery at Padua, of whom we hear in 1421, 1424, 1427, and 1429. He was a surgeon of great manual dexterity and ingenuity, a writer of naïve gusto, and a man of vigorous personality.[119] There was Sante Ardoini of Pesaro who

[118] *Ibid.*, fol. 92v, "de argento vivo"; fol. 93r, "de gaio"; "de syracusano"; fol. 93v, "de mensura auri et argenti"; fol. 94r, "in fundendis rebus"; "in sonis et vocibus."

[119] See my *Science and Thought in the Fifteenth Century,* 1929, Chapter III, "The Manuscript Text of the *Cirurgia* of Leonard of Bertipaglia."

began his work on poisons at Venice on November 8, 1424, and finished it there on May 14, 1426.[120] Although the book is primarily a compilation, it displays the same independence, self-confidence, and experience as those of Fontana and Bertipaglia, and is full of allusions to what its author has seen or heard at Venice and his medical practice there. There he had often seen the torpedo fish.[121] From those who brought resin of larch to Venice to sell and who spent their lives about the groves of such trees he learned how different it was from turpentine for which it was often substituted in compounding theriac.[122] Indeed, he had composed a distinct treatise on the virtues of resins. He also distinguishes between the arsenic brought to Venice from the orient and from Germany,[123] and between different kinds of alum, including what is popularly termed *alumen de pluma* at Venice.[124] Or he tells of the case of a rich merchant from Pesaro at Venice whom he and three other doctors attended for two months, when he discovered that the patient was suffering from arsenic poisoning.[125] Or he notes that in the electuary, *Anacardina,* Venetian practitioners commonly substitute seed of juniper for *burungum,* a black seed like pepper brought from Siena.[126] He had tried repeatedly all sorts of stones found in local mines and rocks for scorpion bite, and they were of no benefit whatever.[127] But he remains credulous concerning other occult virtues, concerning basilisk, dragons, and echinus, and repeats a ceremonial for plucking an herb.[128] He had sought information from an herbalist and from the fishermen of Venice.[129] He had himself fished for the sea scorpion and been stung by it.[130] He had eaten many times of the huge crabs found in Slavonia and Dal-

[120] GW 2318: Ardoino, Sante, *De venenis,* Venice, 19 July 1492, 106 fols: "Incipit liber de venenis quem magister santes de ardoynis de pensauro physicus saluatoris nostri confisus auxilio edere cepit venetijs die octavo novembris 1424. Et ipsum ibidem diuino mediante favore finiuit die 14° madii 1426." I have also used an edition of 1562.

[121] *De venenis,* I, 2; VI, 34.

[122] *Ibid.,* I, 10.

[123] *Ibid.,* II, 1.

[124] *Ibid.,* II, 14.

[125] *Ibid.,* II, 1.

[126] *Ibid.,* III, 54.

[127] *Ibid.,* V, 3; p. 299 in the 1562 edition.

[128] *Ibid.,* VI, 2; p. 346 for the last mentioned item.

[129] *Ibid.,* V, 3 (p. 300 in 1562 edition), and VI, 38 and 39.

[130] *Ibid.,* VI, 38.

matia.[131] It is such glimpses of real life and practical experience, combined with evidences of an inquiring mind and inventive genius, and a very considerable residue of occult science and credulity, that our physicians and surgeon of the first half of the fifteenth century have in common.

Their association with Venice and its university town, Padua, is also not to be overlooked. In the one the world of books, and in the other the book of the world was open to men's gaze. The importance of Florence in the culture of the quattrocento has sometimes been exaggerated. Our physicians and surgeon tell another story. They stand at the gate to the north and to the far east, even to the south beyond the equator. They curiously search the sky or the depths of the sea. Their prime interest is not classical antiquity or sentimental humanism. They are interested in their own cases, in their own technical improvements, in the world of things, in clocks and chemistry, in mechanical and surgical devices, in measurement and certification. And there is much at Venice to stimulate and feed their curiosity: travelers with tales of the empire of the Great Khan or of the Indian Ocean, patricians inclined to investigate whether deep sea water is sweet or salt, vendors of drugs and minerals from afar, fishermen and herbalists,[132] improved maps. This wealth of information and suggestion broadens their outlook and gives them confidence in their own times and selves. And so, with a spirit of inquiry and ingenuity which may be a little naïve but is equally sincere, they look forward not backward, and out on the world of phenomena as well as into their books.

[131] *Ibid.*, VI, 37.

[132] It was at Venice that in 1415, after various travels and study at Padua, Benedetto Rinio settled down and composed his *Liber de simplicibus*, beautifully illustrated by the painter, Andrea Amadio. The MS, now S. Marco VI, 59 (Valentinelli, XIII, 10), is described by Valentinelli, V (1882), 61-67, and the text is edited with full commentaries, indices, etc. by Ettore de Toni in *Memorie della pontificia Accademia romana dei nuovi lincei*, Roma, V (1919), 171-279; VII (1924), 275-398; VIII (1925), 123-264. It is not free from superstition.

CHAPTER XLVI

MICHAEL SAVONAROLA

In the present chapter our discussion will be for the most part limited to the works of Michael or Michele Savonarola[1] on physiognomy and on baths. These seem more original and out of the run of ordinary medical treatises than his *Practica* and other minor writings in medicine. They also are more germane to our investigation.

Michael Savonarola, son of John Savonarola, and grandfather of the reformer, Jerome Savonarola, was born at Padua in 1384 and died at Ferrara in 1464. Tiraboschi states that the acts of the medical college of Padua mention him as a student in 1408,[2] but in the first allusion to him in the records of the university from 1318 to 1405 as edited by Gloria he is already on July 29, 1405 described in a notarial paper as "most famous doctor of arts and medicine."[3] Whether this was flattery or interpolated later, it seems certain that he was not yet an M.D. in 1405. Brunacci, however, in his *Versi sulla malattia degli occhi* affirms that Michael was a scholar in arts in 1401, which seems more likely. By 1412 at least he was a member of the faculty of the university of Padua, since on December 20 of that year he

[1] In the Biblioteca Nazionale at Florence I once saw the monograph of Arn. Segarizzi, *La vita e le opere di Michele Savonarola*, Padova, Salmin., 1900, 87 pp.; the only copy in this country appears to be at the Surgeon General's library, Washington, D.C., which very kindly sent the brochure to New York for my use. It divides into four sections: I. biographical; II. opere medici, ascetische, morali, politiche, storiche, epistole, versi; III. conclusions; IV. Saggio di bibliografia delle opere di M. Savonarola. The bibliography of Michael Savonarola's works given by A. Mieli, *Pagine di storia della chimica*, Rome, 1922, p. 140, is confusing, having run different titles together. I therefore in the following pages give more details as to Michael's biography and works than I should, were Segarizzi's pamphlet more accessible to most readers. A number of points are added which are not given by Segarizzi.

[2] Tiraboschi, *Storia della lett. ital.*, VI, 660-661, Milan, 1824.

[3] Andrea Gloria, *Monumenti della Università di Padova (1318-1405)*, I (1888), 496; II (1888), 439.

appears as one of the *promotores* of a candidate for a degree. At that date he was as yet himself only a doctor of arts, but on the July 13 following he received the license for the private examination in medicine. Among his *promotores* on that occasion were the famous names in medieval medical history of Giacomo dalla Torre of Forlì and Bartolommeo of the noted Sancta Sophia family of physicians.

On August 16 of the same year Michael was again a *promotor,* this time for his brother, Niccolò, for the degree in arts, and on the twentieth of that month both brothers received their degrees, Michael the doctorate in medicine and Niccolò that in arts. Probably the conferring of Michael's degree had been delayed since July for this purpose. Michael's name continues to appear at intervals in the records of examinations and degrees at Padua from 1415 to 1440, but seemingly he was absent from the university a good deal of the time. After he received his degree on August 20, 1413 until August 9, 1420, when he was again present in person, there are only three mentions of him among *promotores* of candidates, one on November 11, 1415, the others for July 29 and 31, 1419, and in all three cases he was a *promotor* in absentia. Between the dates August 23, 1422 and November 5, 1433 his name appears but once, on May 5, 1428.

From 1433 to 1440 Savonarola's attendance became more frequent at these academic occasions.[4] In 1434 he lectured on feast days; in 1436, on the third book of the *Canon* of Avicenna.[5] His name also appears in the Consiglio Maggiore of Padua in the years 1433, 1435, 1438, and 1439.[6] Probably his teaching had previously been often interrupted by medical practice, whether private or in service of the republic of Venice, and by such trips as that with the two Venetian condottieri, Carmagnola and Gattamelata, to mineral baths.

[4] *Acta graduum academicorum gymnasii patavini,* ed. C. Zonta et I. Brotto, Padua, 1922: consult the index for the particular passages involved.

[5] Tiraboschi, *op. cit.,* VI, 661. Segarizzi (1900), p. 9.

[6] Segarizzi (1900), p. 10.

On September 7, 1440 Michael was made physician of Niccolò III, marquis of Este, with a salary of four hundred gold ducats.[7] After Niccolò's death he served Lionello and then Borso in the same capacity. He was connected for at least a time with the university at Ferrara, since his name appears on October 9, 1442 as sponsor for a candidate for a degree, but when faculty rolls begin to appear regularly in 1450, his name is not in them.[8] The *editio princeps* of his *Practica* speaks of him, however, as in the university of Ferrara under Borso as duke.[9] He was admitted to the citizenship at Ferrara on January 28, 1443; received generous grants from Lionello on June 30, 1450, and from Borso on October 15, 1461; and was created a knight hospitaler by pope Nicholas V on December 5, 1452.[10] Michael probably died in 1464.[11]

Savonarola's chief medical work, the *Practica* or *Opus medicinae,* appears to have been finished by 1440 or earlier, since one manuscript of it is dated August 8, 1440.[12] A copy of its opening section was made at Nürnberg already on January 31, 1447[13], and other copies are dated in 1455[14] and 1458[15] respec-

[7] Tiraboschi, VI, 661.

[8] Secco-Suardo, "Lo studio di Ferrara a tutto il sec. XV," *Atti d. deput. prov. di stor. patria,* VI (Ferrara, 1894), 156; cited by Segarizzi (1900), 60.

[9] Ed. Colle, Bonus Gallus, 13 Aug. 1479; Hain-Copinger 14480, Proctor 7243; copy in U.S.A. at Wisconsin Historical Society. In the sumptuous large folio edition of 1486 (Venetiis per Andream de Bonetis de Papia x Maii Mcccclxxxvi) we likewise read, fol. 1r, col. 1, "In studio Ferrariensi sub excellentissimo duce Borsio. . . ." Various other editions followed: Bologna, 1487; Venice, 1491, 1497, 1498, 1547, 1559, 1561. I have chiefly used that of Venice, 1497 (mandato et expensis Octaviani Scoti, per Bonetum Locatellum).

[10] Segarizzi (1900), pp. 11-13.

[11] *Ibid.,* pp. 14, 64-65.

[12] Vendôme 243, 15th century, 120 fols., Michael de Sanguinerola, Opuscula medica. "Expliciunt tractatus magistri Michaelis de Sanguinerola, artium et medicine doctoris, anno M°CCCC°XL, die octava mensis augusti." While the catalogue describes the manuscript as if there were five treatises, they correspond in subjects to the first five of the six tractates in the *Opus medicinae* as printed at Venice in 1497.

[13] CLM 12021, fols. 14r, col. 1-51v, col. 1: rubric, "Incipit directorium ad actum practicum compilatum a famosissimo artium et medicine doctore magistro Michaheli de Savorola. Ex speciali directione magistri Antonii Cermizonis principis medicorum et ordinarii studii Patavini principalis." The text then opens, "Ut ad te quidquam tibi gratissimum transcriberem sepenumero mecum cogitaverim amantissime frater . . .", which corresponds to the third sentence in the preface to Sigismund de Polcastris in the edition of Venice,

tively. The work was addressed to Sigismund de Polcastris, his younger colleague at Padua, at whose examination for the licentiate in medicine in 1422 he had served as a *promotor*.[16] The fact that the work was not addressed to one of the Este family further suggests that it was composed before Michael left Padua. And the fact that it seems written to a novice in medicine makes it plausible that it was undertaken at about the time Sigismund received the licentiate.[17] Segarizzi, however, has noted in the work an allusion to an epidemic of pleurisy at Padua, Treviso, and Venice in March 1440,[18] so that the *Practica* must have been finished after that date if this passage occurred in the original version and was not inserted later.[19]

Distinct from the *Practica,* which was Michael's most general medical work, was his treatise on fevers, although it was sometimes called *Practica canonica de febribus* but more often simply *Canonica de febribus*.[20] It alludes to the arrival at Venice in 1437 of Greeks bound for the council of Ferrara and is found in a manuscript at Munich dated 1439-1444.[21] Another distinct work, although it was sometimes bound with the work on fevers or other treatises, was the *Summa de pulsibus urinis et egestionibus*. It is, indeed, really a group of three works on these three subjects, and seems to have been written at Ferrara.[22] A treatise on worms was dedicated to a Zanardo who had acted as godfather to one of Michael's children.[23]

The works on physiognomy and baths, upon which we shall center our attention, were also written after Michael's coming to Ferrara and are addressed to Lionello and Borso respectively. They are thus products of Savonarola's maturity. Of the same period are evidently his pest tractate addressed to the city of Ferrara[24] and a work on the happy progress of the most illustrious Borso of Este to the marquisate.[25] The pest tract was written in the vernacular for popular instruction and consumption, and recommends certain amulets as safeguards. After coming to Ferrara Savonarola did not forget Padua, however, for his historical essay, *On the magnificent ornaments of the royal city of Padua,* was written about 1445.[26] In it Michael took the reputation for magic of Peter of Abano very coolly, remarking that it merely helped to round out Peter's learning and to make him the more illustrious.[27] Yet Michael was a devout Christian who penned many devotional and ascetic treatises, such as a confessional, praises of John the Baptist, and a discussion of the cure of spiritual languor.[28] Again in the *Physiognomy* he noted

1497. The opening section given in this MS comprises six chapters, of which the last is lacking in the printed edition of Venice, 1497, which has only five chapters. The text of our MS closes at fol. 51v, col. 1: ". . . Tu itaque mi frater ad hoc te accomoda ut de te recte opinatur. Et ex hys fidem in populis facias quam veram non sophisticam de te fieri studeas ut optimus Ihesus in cunctis tibi suadeat qui pro nobis nostraque omni salute passus est in cruce. Amen." A colophon then adds, "Finitum anno legis gratie 1447mo ultima die mensis Ianuarii in Nurenbergensi."

[14] Bologna A. 125, anno 1455, 440 fols., of which 437-440 are left blank: Michael Savonarola, Opus practicum. The opening words, "Grave onus non minusque laboriosum . . ." are the same as those of the preface to Sigismund de Polcastris in the edition of Venice, 1497.

[15] Estense 462; see Segarizzi (1900), p. 79.

[16] *Acta graduum,* No. 579.

[17] He had been a student in arts as early as 1412: *Acta graduum,* No. 235.

[18] Segarizzi (1900), p. 15, citing the edition of Venice, 1561, fol. 128.

[19] The phrase, "ut accidit meo tempore 1440," rather implies that the writer late in life is looking back on past years. Segarizzi, however, believes that the work was finished before Michael left Padua.

[20] Printed Ferrara, 1485; Bologna, 1487; Venice, 1496, 1498, 1503, 1552, 1561, 1563; Lyons, 1560.

[21] Segarizzi (1900), pp. 16-17.

[22] Printed at Bologna, 1487; Venice, 1497, 1498, 1503, 1563; Lyons, 1560. Segarizzi (1900), p. 82, mentions MSS at Munich and Vienna but does not give their shelf-marks. One at least is Vienna 5400, 15th century, fols. 1r-29v, Michael Savonarola de urinis, "Urina est aquositas superflua. . . ."

[23] *Tractatus de vermibus,* printed with other works by Michael at Venice, 1498, 1503, 1563; Lyons, 1560. Segarizzi (1900), pp. 17 and 80.

[24] *Archiv f. Gesch. d. Medizin,* XVI, 180, describing what Segarizzi says is the sole known MS, Bibl. Bertoliana di Vicenza 177 (now 7.6.27), fols. 2v-18v.

See also Morelli, *Biblioteca manoscritta di Tomaso Giuseppe Farsetti,* Venice, 1771-1780, MS 19, membr. 15th century, Ad civitatem Ferrariae de preservatione a peste et eius cura, opening, "Nulla cosa è tanto all' uomo acerba . . ."

[25] Tiraboschi, VI, 662; Segarizzi (1900), pp. 83-84.

[26] Muratori, *Scriptores rerum Italicarum,* XXIV, 1135 *et seq. Libellus de magnificis ornamentis regiae civitatis Paduae* is the proper title as given in the new edition of 1902 by Segarizzi. "Commentariolus de laudibus Patavii" was simply Muratori's description of it.

[27] *Magic and Experimental Science,* II, 888-889.

[28] For these see Segarizzi (1900), pp. 31-34, etc.

that Peter was accused of nigromancy but that the vulgar are too ready to believe that men are vexed by impure spirits, although it is not to be denied that this is possible.[29]

At the suggestion of the jurisconsult Roselli, Michael composed and dedicated to Lionello as marquis of Este a treatise in twelve chapters on *aqua ardens* in which he accepted the conception of alcohol as a fifth essence and told of noted men who had lived long by using it.[30] A vernacular text on gout[31] may be an extract from his *Practica,* and perhaps another vernacular work on things which are commonly eaten[32] is paraphrased from the section of the *Practica* in eleven chapters on compound foods. It was dedicated to Borso sometime after May, 1452.[33] To Borso as duke of Modena and Reggio Savonarola further dedicated a work on the six phases of diet or daily medical regimen,[34] which is perhaps the same as the second tractate of his *Practica.* For women Michael wrote in Italian *De regimine praegnantinum et noviter natorum usque ad septennium,* with a closing chapter on the moral education of children.[35] For a few other minor medical works by Savonarola[36] and for his other literary productions

[29] S. Marco VI, 156, fol. 54v, col. 1: "... Conciliator noster qui nigromantie nomine accusatur. . . . Neque sic facile credendum ut vulgares (col. 2) opinantur homines spiritibus immundis vexari quod autem possibile sit non negandum."

[30] The work was printed at Pisa on September 22, 1484 by Gregorius de Gentis, "Ad divum Leonellum Marchionem Estensem libellus de aqua ardenti Michaellis Savonarole phisici sui feliciter incipit. Cum vir gravissimus Antonius Rosellus . . ."; at Hagenau in 1532 by Valentinus Kobian: and at Basel in 1561 by Gratarolus. The prayer for Lionello's health at the close of the editio princeps is omitted in the two latter editions. A MS mentioned by Carbonelli (1925), p. 10, is at Rome, Bibl. Casanatense 1232, 15th century, quarto, De aqua ardente.

[31] *De gotta la preservazione e cura,* Pavia, 1505.

[32] *Libretto de tutte de cose che se manzano comunamente, quale sono contrarie e quale al proposito e como se apparechiano,* Venice, 1508, 1515, 4to, 64 leaves; 1554, 1575. Spanish translation, Seville, 1541. For MSS see Segarizzi (1900), p. 81.

[33] Segarizzi (1900), p. 25.

[34] There is a MS of it at Naples, all in Italian, Bibl. Nazionale XII.E.3. Michaelis Savonarolla, Libellus de VI rebus non naturalibus ad Dom. Borosum (*sic*) ducem Mutinae at Regii etc. At Rome, Bibl. Casanatense 406, Michele delle Savonarola, De sex rebus non naturalibus, is presumably in Latin, but I have not examined the manuscript.

[35] Vatic. Reg. Suev. 1142, 15th century, fol. 1r.

[36] See Segarizzi (1900), pp. 28, 82.

the reader may be referred to Segarizzi's monograph. Carbonelli reproduces from a manuscript what seems a likeness of him seated reading and wearing pince-nez.[37]

While we are to give our attention primarily to Savonarola's works on physiognomy and mineral baths, we should perhaps say a further word as to the *Practica.* It divides into six tractates, of which the first, in five or six chapters,[38] is devoted to procedure—in investigating the causes of disease, in curing disease, and in prognostication. The fourth chapter deals with the administration of medicines and "its most advantageous hour," and the sixth with the physician's personality. The second tractate takes up the familiar six non-natural things (*de sex rebus non naturalibus*)[39] of medieval medical treatises in nine chapters. Composite foods are considered in eleven chapters in the third tractate. The fourth tractate in thirty-four chapters considers various medicines according to their effects.[40] This provides an interesting classification of medicines into attractive, aperitive, opilative (that is to say, obstructive), constricting, mollificatory, indurative, purifying and abstergent, those that generate flesh, corrosive, those that excoriate,[41] those that parch, those that form scars, those that conglutinate, those that attenuate and render subtle, incisive, rarifying, diaforetic and resolving, repercussive, carminative and breaking up wind, digestive and ripening if applied externally, biting, reddening, comforting, softening, lubrifying, mitigating pain and narcotic, harmful, poisonous, bezoardic, aids to digestion to be taken internally, solutive, digestives adapted to disorders of each member, evacuatives adapted to the disorders of each member, and comforting remedies adapted to the disorders of each member. Most of the terms in the foregoing list will be found, however, together with yet others, in Avicenna's chapter on the operations of different

[37] Carbonelli (1925), p. 10, from Bibl. dell' Archiginnasio, Bologna, A. 125.

[38] Five in the editions of 1497 and 1547, six in CLM 12021, as above stated.

[39] See note 34 for what are probably separate MSS of it.

[40] "De simplicibus et compositis cum suis virtutibus secundis tertiis et quartis usualibus magis."

[41] Cap. 10, "De vicerantibus (viscerantibus?) et excoriantibus."

medicines.[42] The fifth tractate of Savonarola's *Practica* considers in four chapters[43] the simple and compound medicines which physicians use in healing in their *Antidotaria*. The sixth and last tractate devotes twenty-two chapters to particular diseases arranged in the common top to toe order.

The Mirror of Physiognomy of Michael Savonarola is of interest as a fifteenth century specimen of works on that subject, of which we have a series from Greek antiquity through Arabic and medieval Latin down into early modern times. The fundamental doctrine of physiognomy, that human character and aptitudes may be largely inferred from the observable external physical features of the various parts of the body—and not of the face alone—may be regarded as a somewhat plausible and not unnatural theory which bordered on the realm of science—or at least of pseudo-science—and was not a province completely bounded on all sides by magic, superstition, and error. It further should be noted that physiognomy was more closely in accord with the conceptions of medieval physiology and medicine than with those of modern science, and so seemed to that period even more than to us to make a fairly close approach to scientific method and content and to conformity with natural law. For at that time prevailed the conception of *complexio*. By *complexio* was denoted one's total state of health, one's physical constitution considered as a unit, one's particular complex of physical and mental traits as collectively distinguished from those of another person. No intelligent physician, according to the best medieval medical opinion, should prescribe for a particular patient without taking carefully into account that person's own peculiar *complexio*. What might do for a person of choleric humor would perhaps poison a sanguine individual or have no

[42] *Canon.*, liber II, tractatus I, cap. 4, "De operationibus medicinarum singularium," edition of Basel, 1556, pp. 171-174.

[43] In the edition of 1497 which I have used at the Academy of Medicine, New York; ten chapters, according to Alexander Rittmann, *Culturgeschichtliche Abhandlungen über die Reformation der Heilkunst*, Brünn, 1869, Heft I, C. Johannes Michael Savonarola, p. 80. At pp. 81-133 follows a much fuller analysis of the *Practica* than we can give here.

effect at all upon a phlegmatic patient. No medieval physician would think of indiscriminately recommending the same diet to a person of hot as to one of cold temperament or the same drugs for a dry as for a moist disposition. And so on with yet more individual idiosyncracies. It was left for recent medicine to entertain such grotesque ideas—so they would have seemed to the fifteenth century—as that men wholesale should be vaccinated or should all take the same treatment against typhoid fever, or that all those suffering from the same kind of indigestion should follow the same printed diet, or the still more extraordinary notion that a doctor should specialize in nose and throat alone, or that because a certain number of rabbits or guinea pigs or other inferior organisms experienced uniformly—or without perceptible difformity—certain effects from certain injections, that therefore such superior and highly individualized *complexiones* as those of human beings should be subjected to an analogous regimen. Such inferences would have impressed the scholastic mind as a bit illogical. Medieval science and medicine did not believe that a living organism could be cured in sections. They entertained queer enough notions, it is true. They might hold that taking a part of some other animal internally or externally would alleviate some human disease. But they did not fancy that by extracting one's teeth or tonsils or appendix all poison or noxious humors could be removed from the system. The medieval mind would have recoiled in horror from such to it irrational assumptions. Perhaps the cell-theory has too completely ousted the *complexio* theory, or possibly modern medicine has been influenced a little too much by current ideas of mass production and consumption and socialism, just as medieval medicine was over-affected by scholasticism.

It is not, however, our purpose here to argue *in extenso* the case for the philosophy of *complexio* against that of wholesale administration of serums, excessive specialization, or unlimited surgical operations. Our aim is to suggest that with the doctrine of *complexio* generally accepted it was the more easy to believe in physiognomy and to credit the supposition that every part of

the whole would reflect, just as it participated in, the state of health, the physical constitution, and the personal equation of the whole, and that in every part of the body there should be signs of its own, particular, peculiar, individual *complexio*.

We need not then be surprised to find Michael Savonarola expounding the theme of physiognomy to Lionello, the marquis of Este.[44] The marquis is not designated by name in one copy of it but is in the other. Moreover, in his work on baths, addressed to Borso, Savonarola states that the physiognomy had been sent to his brother. In the preface, which otherwise need not detain us, Savonarola calls the marquis's attention to the joy in store for him when he is able to tell his sons' different aptitudes for different careers from the science of physiognomy.[45] Lionello had two sons, one legitimate, Niccolò, born in 1438 and beheaded in 1476, and one illegitimate, Francis, who was born in 1444. Borso seems to have had no children which increases the certainty that the *Physionomia* was addressed to Lionello.

[44] *The Mirror of Physiognomy* seems never to have been printed. I have used two MSS of the fifteenth century, one at the Bibliothèque Nationale, Paris, in which the *Mirror of Physiognomy* occupies the first sixty-seven folios with a large double-columned page. BN 7357, 15th century, fol. 1r, col. 1-fol. 67r, col. 2. Incipit: "Cum sepe mecum animo revolverem, illustrissime Marchio. . . ." Explicit: ". . . Nam hec omnia egi ut clare hoc in speculo videas que meo in pectore sic abscondita iacent. Vale illustrissime princeps ac amice mi domine cui me quam plurimum commendatum facio et iterum ut opto Vale foeliciter. Dei gratia complevi in die 24 marcii 1491." The last sentence does not appear in S. Marco VI, 156. In its date for the year the third digit is somewhat doubtful. It would not be implausible that this manuscript copy was made in 1491 long after Michael Savonarola's death, since immediately following there is bound into the manuscript and numbered consecutively as to folios with it a printed edition of 1485 of his work on baths.

Another complete copy of the work is S. Marco VI, 156, 1465 A.D., fols. 41r, col. 1-112v: noted by Segarizzi (1900), pp. 80-81. It contains the address to Lionello which is missing in the Paris MS, where he is not named: S. Marco VI, 156, fol. 41r, rubric at the top of col. 1, "Ad illustrem et excelsum principem dominum Leonellum marchionem Estensem Ferrarie dominum Speculum phisionomie Michaelis Savonarole dominationis sue philosophi incipit feliciter." The Prohemium then opens, "Cum sepe mecum animo revolverem. . . ." At the top of col. 2 is written, "Opus absolutum ad petitionem Io. Marchanovae artium et medicinae doctoris P. MCCCCLXV. Ferrariae." According to Segarizzi (1900), pp. 20 and 66, S. Marco XIV, 218, contains the preface alone of the treatise on physiognomy but dates it "1442, XI. kal. iunias."

[45] BN 7357, fol. 1v; S. Marco VI, 156, fol. 41v, col. 1.

The first chapter of Savonarola's treatise defines physiognomy; the second mentions certain fundamental points to have in mind in that science (*De documentis in phisionomia*); the third treats of the senses which are of service therein. The next three chapters deal with the significance of white, dark, and medium colors; the seventh chapter, with what may be deduced from form and figure. With consideration of the head, its parts, quantity, and magnitude—the size of the head should be in proportion to the other members of the body but a large head is a better sign than a small one—the numbering of the chapters ceases in our manuscripts.[46] Indeed it is perhaps henceforth not always certain just what constitutes a chapter. However, after a "Speculation concerning the signs of naturally distemperate complexions," we turn from general to special considerations, that is, it appears, to the signs to be noted in particular parts of the body. Dealing with the hair, we find rubrics as to conclusions to be drawn from the color of the hair, of the color of the hair of a phlegmatic person, and the particular physiognomy taken from hair. We pass on to eyebrows, eyelashes, the hair in the ears, nostrils, and elsewhere. Michael then turns to the nails and thereafter treats successively of the eye, forehead, nose, ear, voice, lips, mouth, teeth, tongue, chin, face, neck, shoulders, arms, hand and fingers, breasts, and so forth.

The briefer second book of the *Physionomia* is devoted to the astrological basis of the art. Michael had cited Peter of Abano who had earlier emphasized this astrological basis of physiognomy a number of times in the first book, perhaps more often than any other authority. He usually refers to Peter as "Conciliator," even when citing other works than the opus magnum of that title. He now quotes some lines from the Italian poem *l'Acerba* of Cecco d'Ascoli,[47] the astrologer who in 1327 had been burned at the stake.

Savonarola shows familiarity with the conception of the latitude of forms which was current in the fourteenth and fifteenth

[46] Indeed in S. Marco VI, 156, the last numbered chapter was "Capitulum quartum de colore albo" at fol. 46r, col. 1.

[47] BN 7357, fol. 63v; S. Marco VI, 156, fol. 108r-v.

centuries, but only in a very elementary way. Stating what might seem the self evident truth that, if a human being ought not to exceed six feet in height or fall short of five feet, then five and a half feet is mediocrity, he adds that it is a rule of the philosophers that a uniformly difform latitude extending from a certain degree to another degree has for its mean degree that which is halfway between the two extremes.[48]

Somewhat less obvious, and of note for their relation to the art of the time, are Savonarola's statements as to the measurement of the human body. The average height of man, as experience and nature teach, is nine *testae,* understanding by a *testa* the space from the coronal commissure to the chin. The human face in turn divides into three equal parts from the commissure to the bone joining with the nose or what painters call the hollow of the nose, from this point to the end of the nose, and thence to the tip of the chin. The last named space again has a triple division from the end of the nose to the upper lip, thence to the middle of the chin, and from there to the tip of the chin. The breast to the navel is two testae, the abdomen one, the thigh two, and the shin two. The ninth testa is made up of three equal constituents, the space beneath the chin to the breast which is lost to view as the painters say, the space of the knee cap, and the space from the instep to the ground.[49] The hand measures a testa, the ear one-third of one. Savonarola also mentions the canon of the ancient Greek sculptors that the body with limbs extended should be circumscribed by a circle.[50] Indeed, he states that sculptors have been more exact than painters. Neither Giotto, the Florentine painter who first modernized the mosaics and old figures, nor Jacopo Avanzi of Bologna, nor Justus of Padua nor Alticheri of Verona nor Gaurientus of Padua, though famous men and preeminent in the art of painting, observed these measurements, but each followed

[48] BN 7357, fol. 55r, col. 1; S. Marco VI, 156, fol. 99v, col. 1.

[49] BN 7357, fols. 55r, col. 2-55v, col. 1; S. Marco VI, 156, fols. 99v, col. 2-100r, col. 1.

[50] BN 7357, fol. 56r, col. 2; S. Marco VI, 156, fol. 101r, col. 1.

his own idea and now painted beautiful figures, now irregular ones, in this following nature which not infrequently varies from the norm.[51]

Savonarola displays a slight inclination towards ethnological or anthropological observations. Thus he notes that Slavs usually had hair of a yellow color tending toward red, and were choleric in their animal, motive, and intellectual operations, "although in morals they seemed to deviate"—presumably from their physiognomic norm. This led Savonarola to an extensive consideration which unfortunately he omitted because of its length.[52] Other things being equal, the natives of Ferrara have better intellects than the Paduans because they are tinged—or rather, singed—with the burning of melancholic choler, as Savonarola has brought out in his work *On Ornaments of Ferrara* (*De decorandis Ferrariensibus*). They are therefore more ready of speech but the Paduans have better judgment because their spirits are not so mobile.[53] Child psychology, too, was not entirely neglected by Savonarola, although one fears that his prime motive in the illustration to be given was to tell an amusing anecdote. Pepona, the nine year old daughter of the duke of Milan, he describes as "of remarkable genius" and her father's greatest delight. When count Alberic, constable of king Ladislas of Apulia, was captured and redeemed by Giangaleazzo, duke of Milan, for 32,000 ducats, Pepona looked him over with a rather strange expression on her face. Asked what she thought of him, she said, "You paid too high a price for that winebibber."[54]

Savonarola's treatise is less interesting for the ordinary technique of physiognomy than for various side remarks of a more

[51] BN 7357, fol. 57, col. 2; S. Marco VI, 156, fol. 102r, col. 1.

[52] BN 7357, fol. 18r, col. 2; S. Marco VI, 156, fol. 59v, col. 1, "Et certe in Sclavis colorem capillorum ut plurimum flavum ad ruffum tendentem notavi eosque sic colericos in operationibus animalibus motivis et intellectivis comperi, etsi in moralibus deviare visi sint. Et hic considerationem feci quam eius longitudine in presentiarum (*sic*) omitto."

[53] S. Marco VI, 156, fol. 55r, col. 2.

[54] BN 7357, fol. 27v; S. Marco VI, 156, fol. 69r, col. 1: "quem cum Pepona novem annorum puella mirandi ingenii ducis maximum oblectamentum quodam miro modo conspexisset interrogata quid de viro hoc concipiebat respondit virum vinosum nimis magno pretio emptum."

personal nature revealing his own thought or which serve to illustrate the learning of the time. He expresses the popular opinion in the fifteenth century that every artist is a bit bizarre, thus approaching the now common conception of the artistic temperament or the modern theory which would find relationship between genius and insanity. Mallotus of Syracuse was reputed a poet only after he went mad and the poet Nicolaus wrote better verse after an attack of mania. Conciliator tells of a woman who ceased speaking Latin after she had been cured. Histories of Padua tell of a virgin of that town who prophesied while mad and was followed by a great throng. She insisted that there was an old well full of bodies of the saints under the choir of the church of St. Justina, and excavation proved the truth of her assertion. "Wherefore even until today that day is solemnized by the Paduans and is called the feast of the fool."[55] Savonarola states that those who excel in any art seem to have something of melancholy and to lack ordinary prudence. Singers and musicians often refuse to sing or play except when their own fantasy happens to move them to do so. "And the common people call such persons *bizari* and it is commonly said that no one can be a superior artificer unless he is troubled somewhat by *bizaria*." Savonarola holds, however, that a superior physician should be quite free from any such tendency.[56]

Savonarola shared many of the faults of medieval science. He accepted the ascription of human traits to animals and followed the habit of believing quaint, stock anecdotes concerning them. Thus lions are magnanimous and wise. Their wisdom is shown in their obliterating their tracks with their tails so that

[55] S. Marco VI, 156, fol. 54v, col. 1.

[56] BN 7357, fol. 14v, col. 1; S. Marco VI, 156, fol. 55v, col. 1: "Nam in arte aliqua excellentes certe aliquid melancholie habere videntur eo quod tales aliqua ex parte prudentia carere a vulgo dicuntur. Sunt enim ut melancholici in opinionibus fixi neque precibus ad exercendum artis operationes molliuntur ut in cantoribus et fidibus doctis sepe contingere videmus, neque eas operationes non nisi propria a fantasia moti perfectas conficiunt. Et hos bizaros vulgares nominant aitque vulgus neminem artificem excellentem esse posse nisi aliqua ex parte bizaria vexetur a qua culpa Bizarie excellens medicus omnino vacuus esse debet."

hunters may not follow them.[57] Michael accounts for monstrous births by the influence of the stars, to which he would also attribute the spontaneous generation from putrefaction of lower forms of life such as frogs, mice, moles, bats, and fish. He mentions Avicenna's famous doctrine that the stars would regenerate life after a universal deluge, but prefers to hold with Peter of Abano that the force of the stars is insufficient to generate a perfect animal like man, to whom form is given by God.[58] On the other hand, he repeats the silly, not to say sacrilegious, notion that persons whose arms are so long that they reach below their knees are of the stock of the blessed Virgin.[59]

Savonarola, however, is conscious of the desirability of experimental verification in the subject of physiognomy and states that he has striven to verify what he found written by the philosophers. He has found that many hunchbacks possess great intellectual ingenuity and astuteness.[60]

The work of Michael Savonarola on baths and mineral springs is addressed to Borso of Este.[61] Since Michael speaks of himself as the physician of Lionello, marquis of Este, it would seem that

[57] BN 7357, fol. 29r, col. 1; S. Marco VI, 156, fol. 71r, col. 1.

[58] BN 7357, fol. 32v; S. Marco VI, 156, fol. 75r, col. 2.

[59] BN 7357, fol. 42v, col. 2; S. Marco VI, 156, fol. 86r, col. 2. "Intellexi quidem eos quibus tanta est brachiarum prolixitas ut medius digitus genu pertranseat de stirpe beate virginis existere. Et hec de brachiis."

[60] BN 7357, fol. 42r, col. 2; S. Marco VI, 156, fol. 85v, col. 1: "Ego autem que ex philosophis scripta inveni sic verificare enixus sum verum multos scrumosos subtiles ingenio comperi qui et ceteros in prudentia superarunt astutiisque pleni fuerunt." Savonarola's implied antithesis between what has been written before and his own finding is not wholly justified, however, for in the *Physionomia* of Michael Scot we read, "Gibbus id est strumosus significat hominem sagacem."

[61] I have examined the work of Michael Savonarola on baths, natural and artificial, in the incunabulum edition of 1485. The copy seen by me, however, was bound into a Latin manuscript of the Bibliothèque Nationale, Paris, where it followed the work of Savonarola on Physiognomy, and was in turn followed by three works of Arabic astrologers. BN 7357, fols. 7or-108v, printed in double columns. Eiusdem de balneis et thermis naturalibus omnibus Italiae, impr. Ferrara per Andream Gallum, 1485. The rubric or titulus will be given in the next footnote. The text opens, "Cum generosum animum tuum que maxime delectarent. . . ." The work occupies the first 36 leaves in the collection, *De balneis*, Venetiis apud Junctas, 1553, which I shall occasionally cite for passages for which I am no longer able to refer to BN 7357.

the treatise was written before 1450, when Lionello died, to be succeeded by his brother Borso until 1471.[62] But inasmuch as Michael later in the work refers to quartan fevers which were epidemic at Ferrara in 1460, it would seem either that this date is a misprint for some earlier one, or that the edition of 1485 is responsible for inserting the titulus with its statement that Michael was Lionello's physician, and its failure to name Borso as marquis, or that Savonarola made additions to the text between the time when it was dedicated to Borso and its appearance in print. The first or last of these three alternatives seems the most likely, since a little after the opening of the work on baths Savonarola, speaking of it and the work on physiognomy in one breath, states that he had sent the latter to "the most illustrious prince, your brother," and dedicates the former "in your name." He also states that Theodore Gaza, who was at Ferrara from 1444 to 1449 or thereabouts, had translated both works into Greek.[63] The original draft of both works therefore appears to have been composed while both Este brothers were living. The allusion to fevers epidemic at Ferrara in 1460 agrees with the evidence for Michael's being still alive in 1461 which exists in the shape of a grant to him by Borso of certain possessions in the district of Ferrara on October 15, 1461.[64]

Savonarola was very proud of both his works on physiognomy and baths, which were composed after he had already written many other volumes. If he owed thanks to God for the favorable reception which his previous treatises had been accorded by the most learned men, he felt that he should be even more grateful to Jesus for his ability to achieve the two present works, "since I have read no one before me who has treated matters of

[62] The titulus in the edition of 1485 reads as follows: "Ad Illustrem dominum Borsium estensem Castrinovi tortonensis dominum libellus Michaelis Savonarole Illustris principis domini leonelli marchionis estensis phisici de balneis et termis naturalibus omnibus ytalie sicque totius orbis proprietatibusque earum incipit feliciter."

[63] Segarizzi (1900), p. 22; Tiraboschi, VI (1824), 1190-1191.

[64] Antonio Favaro, "Intorno alla vita ed alle opere di Prosdocimo de' Beldomandi," *Bullettino di bibliografia e di storia delle scienze matematiche e fisiche,* XII (1879), 10-11. Tiraboschi, *op. cit.,* VI, 663-664.

such diversity and in the same way and order."[65] The Greek Theodore, rector of the local university, had paid him the compliment of translating the two works from Latin into Greek.[66] This was presumably Theodore Gaza, who, as has been said above, was at Ferrara from about 1444 to 1449. In closing the work on baths Savonarola was again struck with admiration for what he had achieved and rendered thanks to God. He regarded his treatise as a necessity for the medical profession and the health of mortals, as more lucid and detailed than previous works on the subject, as a boon to posterity and as enlarging the glory of the name of Este.[67]

This may seem presumptuous talk on Michael's part and on the same order as the conceited assurances of contemporary humanists that their works would confer immortality upon their patrons. He to a considerable extent treats of the same topics as previous works on baths and does not always improve upon their views. Thus John de Dondis had questioned the ascription of *De proprietatibus elementorum* to Aristotle; Savonarola unquestioningly accepts it. John had rejected the Aristotelian view that hot springs derive their heat from flowing over sulphur; Savonarola repeats it approvingly.[68] However, the fourteenth and fifteenth centuries were a time when most of the leading topics of medieval learning and science had been repeatedly treated

[65] BN 7357, fol. 7or, "Et si plurima ac multa volumina scripserim (fol. 7ov) que apud doctissimos viros laude digna fiunt (?) pro quibus deo summo nostro semper gratias debeo quas saltem possum continue agens, pro hiis tamen duobus operibus quorum alterum illustrissimo principi fratri tuo transmissi quod phisonomie speculum intitulavi et hoc quod tuo nomine insignivi longe magis Iesu optimo me debere sentio cum ante me neminem legerim qui eas materias ita diversas eoque modo et ordine conscripserit. . . ."

[66] *Idem,* "Nam Theodorus grecus bonarum litterarum doctor et nostre universitatis gloriosus rector duo opera hec de litteris latinis in grecas transduxit."

[67] BN 7357, fol. 108v, col. 2: "Quibus omnibus accipiatur primo quam necessarius fuit communitati medicorum et mortalium salubritati noster hic libellus cum ante me memoria hominum neminem scripsisse ita luculenter diffuse aut paucos intellexerim pro quo semper gratias ac laudes deo meo do. Nam sic utilis erit posteritati hominum et medicis qui de consulendis balneis amplam claram atque exquisitam in eo notitiam habebunt ut consilia in scriptis sic absque gravi labore componant. Secundo quantum ad nominis tui gloriam accedet. . . ."

[68] *De balneis,* 1553, fols. 10r, 11r, 36r.

and all their various possible ramifications pretty thoroughly explored. It was not easy to tread virgin ground, as we suspect from the air of triumph with which Michael develops his new theory to explain the common belief that baths lose their virtue in leap years. He says,

> And since this thing is worthy and novel, moreover hitherto touched on or ventilated by no one, I have decided to add here what I have conceived as to it in my mind, in order that, even if my suggestions are not true, at least the occasion for investigating the truth may be given by me.[69]

Presently he adds:

> The explanation of this disputed question I do not make easily, since I know of no one who has until now attacked it. For to reveal the cause of hidden things is not the work of an ignorant person but of a philosopher. Wherefore no one ought to wonder if I approach it with trepidation and if I sometimes make mistakes in unfolding it.

He feels that he will at least open up the matter for others and that he will be pardoned any initial errors on this account.[70]

It should not be thought that Savonarola did not, to some extent at least, admit his debt to previous treatises on baths. He speaks with respect of the investigations by Hugolinus of Montecatini of the baths of that place[71] and of the baths of Lucca.[72] Gentile da Foligno is also cited more than once,[73] and John de

[69] BN 7357, fol. 102r, col. 2: "Et cum res hec digna sit et nova a nemineque autem tacta aut ventilata hinc addere decrevi que de ea animo concepi ut si vera non fuerint saltem sic per me ad investigandam veritatem ocasio detur."

[70] BN 7357, fol. 102v, col. 1: "Huius autem dubitationis causam equidem non facilem facio cum usque in presentiarum neminem intellexerim illam agressum esse. Nam ocultorum causam aperire non est ignorantis verum philosophantis opus. Quamobrem nemo mirari debet si trepidus illam agredior sique eius in apertione quandoque deficiam. Ego quidem id arbitratus sum agere ut saltem ad eam aperiendam occasionem prestem quo fiet ut ea oculta manifestabitur quare venia mihi prius concessa ad eam manifestandam me convertam."

[71] BN 7357, fol. 97r, col. 1: "Vir insignis Ugolinus de monte catino de balneis eiusdem castri scripsit quarum virtutes quas magno cum studio ipse doctor investigavit silentio non preteribo." *Ugolini physici de Monte Catino liber de balneis* was printed in the collection, *De balneis*, Venice, 1553, fols. 47-57.

[72] BN 7357, fol. 93r, col. 1.

[73] BN 7357, fol. 92r, col. 2: ". . . ut de ipsa aqua scribit vir divinus noster Gentilis suo in tempore plurimas vidisse mulieres steriles que huius aque beneficio fecunde facte fuerunt." See also fol. 93r, col. 1, "Gentilis vir divinus enuntiavit cui non parva fides danda est"; fol. 95r, col. 1, where two treatises by Gentile are cited.

Dondis is quoted at length.[74] Hermes Trismegistus is mentioned as a representative alchemist, and Albertus Magnus is referred to as "the great Teuton."[75]

The plan and contents of Michael's work are briefly as follows. He first discusses what a bath is, then treats of particular forms of baths such as those of hot water, of wine, in oil, in milk, in moist air, in dry air, and of a dry and fiery character. The second book on the natures and properties of natural baths begins by recounting the properties of various minerals which are found as constituents in such baths: namely, sulphur, alum, salt, soda, potash, chalk, gypsum, iron, and copper. After a chapter on composite baths, Savonarola treats of various particular baths in different parts of Italy, from Abano to Sicily. These will suffice, he says, to illustrate those of the whole world. He next discusses at what time of year it is best to frequent such baths. We pass to bathing in sea water, to baths artificially composed, and to signs by which one can tell whether a bath will be wholesome or injurious to health in the ensuing year. Canons for the use of baths in general and for the baths de la Poreta in particular conclude the work.[76]

Michael displays an independent attitude towards authority and a reliance upon personal experience and testing in his work on baths. He was amazed not to find in Dioscorides or Serapion or Avicenna any statement of the effect of alum upon the nutritive members. Yet in his own time the baths de la Poreta were highly commended for complaints of the stomach and intestines, especially those arising from a cold cause. He ascribed this virtue to their strong styptic property.[77] John de Dondis had stated

[74] BN 7357, fol. 88r, col. 2; fol. 108v, col. 1.

[75] *De balneis*, 1553, fol. 11r, col. 2, "Haec verba teutonici magni"; fol. 12r, col. 1, "Teutonicus noster."

[76] For a list of its headings or rubrics see Appendix 45.

[77] BN 7357, fol. 82r, col. 1: "Non invenio a Diascoride neque a Serapione et ab Avicenna in membris nutritivis alumen proprietatem habere. Unde non parum admiratus sum ut cur balnea delaporeta in passionibus stomaci ac intestinorum

that the water of a certain spring had no perceptible taste before it was boiled, but Michael and many other persons who had tasted it in his presence had experienced the contrary.[78] Nor did Savonarola unhesitatingly accept what others professed to have experienced. Concerning another water certain writers stated that they had analyzed it in the alembic and found that it contained lime, but Michael considered it more likely that it contained potash.[79] But as a rule for the matters dealt with in this work on baths he prefers experience to reason as a criterion and arbiter. "All these things," he remarks in one passage, "are probably so, yet lack logical demonstration, but experience is the mistress of all these discordant matters."[80] Elsewhere he states that in medicine experience is always to be trusted rather than reason, since the physician is "a sensual artificer."[81] It is true that he often says, "And here is opportunity for speculation," but he seems to employ the last word more in the sense of active investigation than of speculative rumination.[82] Savo-

precipue ex causa frigida venientibus tantam laudem commendationemque receperint. Ego quidem hanc virtutem eis ex eorum forti stipticitate sic atribuo quare stomacis relaxis humidis sic mirabiliter subveniunt."

[78] BN 7357, fol. 89r, col. 2: "Quod autem dicit quod ante decoctionem nullus percipiatur sapor, certe pace sua contrarium expertus sum et qui plures in presentia mea gustarunt."

[79] BN 7357, fol. 88r, col. 1: "Et quidam se per alembicum expertos esse scribunt ipsum calce participare. . . . Verisimilius iudicandum puto illam cinere magis quam calce participare."

[80] BN 7357, fol. 89r, col. 2: "Hec omnia sic probabilia sunt demonstratione logica carentia sed experientia est omnium harum discordiarum magistra." Similarly at fol. 93r, col. 1, he says: ". . . cum experientia sit omnium harum verus iudex."

[81] BN 7357, fol. 92r, col. 2: ". . . verum a medico semper experientia magis credendum est quam rationi cum artifex sensualis sit."

[82] "Et hic est locus speculationis." Other passages suggesting the sense in which the word is used are: fol. 92r, col. 1, "Mineralium autem dictorum virtutes speculator diligenter advertat quibus sic compositis aqua hec participat . . .": fol. 92v, col. 1, ". . . Et subtilis indagator speculetur"; fol. 92v, col. 2, ". . . Et hic diligenter advertat speculator." In short, *speculator* and *indagator* seem employed in much the same sense that *experimentator* is used in medieval works. The word is somewhat similarly employed as early as 1231, when William of England began his translation of the *Saphea* of Arzachel or al-Zarkali of Toledo as follows: "Siderei motus et effectus motuum speculator et duplex dux Ptholomeus inter cetera sui ingenia astrolabium edidit et unicuique climatum propriam tabulam depictavit . . ."

narola does not merely tell us when he has personally experienced a thing,[83] but also when he has not. Past writers differ as to the minerals contained in the baths of Viterbo and he has not tested the matter, but anyone who wishes to can do so by employing the method of alembication mentioned below.[84] The following may be cited as a curious example of experimental research in the fifteenth century. While Savonarola was in attendance upon the famous condottiere Carmagnola at the baths of St. Helena, they had a dispute as to how these compared in heat with those of Abano which the mercenary leader had previously visited. They accordingly despatched a messenger with a clock and a phial to Abano. At an agreed time two phials were simultaneously filled, one from the baths of Abano, the other from those of St. Helena, and they were found—presumably when they had been brought together, each having had an equal time to cool off in—to differ little in heat.[85] However crude, this is perhaps one of the earliest recorded instances in which a clock, presumably mechanical, was employed to regulate an actual purposive experiment.

Francesco Bussone, count of Carmagnola, a place which is consistently spelled Carmignola in the 1485 edition of Savonarola's text, is said in Chevalier's *Répertoire* to have been born at Carmagnola in 1390[86] and to have died at Venice on May 5, 1432, when indeed he was beheaded. But according to another passage in Savonarola's treatise Bussone must have been born before 1390. In this passage, in order to illustrate the point that,

[83] As in the passage, "Et ego iam expertus sum et inveni libram mediam ventrem solvere," BN 7357, fol. 87v, col. 2.

[84] BN 7357, fol. 96r, col. 2: ". . . et ego illam non fui expertus. Sed qui voluerit experiri poterit cum documento infra ponendo dum de elambicatione aquarum termarum sermo fiet."

[85] BN 7357, fol. 91r, col. 1: "Et ego dum cum magnifico capitaneo Carmignola in balneis his pro cura sua moram ac stationem traherem, de caliditate balnearum ebani disputantes in quibus se prius balneaverat, hec sic adinvicem comparantes nuntium specialem misimus ebanum—locus est ab hoc tribus miliaribus distans vel circa—secum portantem orologium et fialam, et data hora implete fuerunt due fiale una ex aqua ebani altera ex aqua hac, et certe in caliditate multum differentes invente non fuerunt."

[86] Battistella, *Il conte Carmagnola*, Genova, 1889, p. 5, favors an earlier date such as 1380, however.

if necessary, one may use natural baths in winter provided one guards against the cold sufficiently, Michael states that he accompanied the two Venetian condottieri, Carmagnola and Gattamelata, to the baths in January when they were afflicted with paralysis. They recovered marvelously. Carmagnola, who was forty-eight, very nearly regained his pristine health. Gattamelata, who was sixty-six, did not convalesce so well, although he did better than they had expected.[87] If Savonarola is correct in his recollection that Carmagnola was about forty-eight then, he must have been more than forty-two at the time of his death. Gattamelata died at Padua on January 16, 1443, but as the date of his birth is uncertain, the statement that he was then sixty-six does not help to determine the year when Michael accompanied the two generals to the baths in midwinter.[88] At any rate Michael seems to write after the death of both men. Like Ugolino de Monte Catino, he makes other mentions of distinguished patients of his, of which the foregoing must suffice as an example. We may note, however, that in opening the treatise he calls Borso's attention to the fact that Pandolfo Malatesta gave the seat of honor to a physician at a dinner to which were invited the lords of Ferrara, Mantua, Rimini, Pesaro, and Cesena. He further asks Borso's indulgence if in the course of the treatise he sometimes engages in medical digressions. In connection with these mentions of princes and great men we finally may note that Savonarola in another place represents them as not infrequently the objects of attempts at poisoning and as diligent seekers after antidotes,[89] in which remark he corroborates the impression which we get from the treatises on poisons written during the fourteenth and fifteenth centuries.

[87] BN 7357, fols. 99v, col. 2-100r, col. 1: "Nam de his experientiam habui in duobus ducibus exercitus illustris dominationis Venetiarum, comite videlicet Carmignola et Gatamelata. Hii enim ambo paralisi molestati fuerunt pro qua dispositione etiam consilio aliorum valentium virorum balnea de mense ianuarii profecti sunt et ego cum eis qui mirabiliter convaluerunt, Carmignola etate 48 annorum fere usque ad sanitatem pristinam, Gata vero etate 66 nimis (minus?) bene convaluit sed potior successit sanitas quam sperabamus."

[88] Segarizzi (1900), pp. 68-69, argues for the year 1441 on the basis of the life of Gattamelata but seems to overlook the fact that Carmagnola was dead then.

[89] BN 7357, fol. 83v, "Et quoniam principes et magnates aut invidia aut inimicitia et odio a venenis non raro molestari consueverunt sicque diligentes antidota contra eum (*sic*) facti sunt. . . ."

While baths may sometimes profitably be frequented in winter, Savonarola thinks that their use even in summer has often been overdone. Not only are they harmful in certain years, but various sorts of persons or those in certain states of health should not risk baths.[90] Moreover, mineral baths and hot springs are liable to have an injurious effect upon the humors of the body, which Savonarola sets forth in this wise.

> The bath by its strong heating properties warms, thins, liquefies, and makes to flow the humors, and so puts them in a state of flux. Wherefore they often run so to different parts of the body that unexpected diseases are engendered thereby, as I have seen in my time. From which one infers that resort is not to be had to baths except for a very urgent reason, whence the common school in treating severe illnesses counsels baths only after all medicaments have been tried.[91]

Only a trained physician who is most learned in his art can properly compose artificial baths.[92]

Some baths had been abandoned by Savonarola's time; others had been recently established or discovered. The baths of St. Bartholomew, founded by local nobles, twelve miles from Padua, had once—"in the time of Bartholomew"—had a church with a hospital for the poor, but now were wooded and uninhabited.[93]

[90] BN 7357, fol. 103v, col. 1.

[91] BN 7357, fol. 99r, col. 2: "Nam balneum sua forti caliditate humores calefacit subtiliat eliquat fluere facit et sic eos in fluxu disponit. Quare sepe ad loca varia sic discurrunt ut inde inopinate eveniant egritudines ut meo tempore vidi. Ex quibus infertur quod non nisi ex causa multum necessaria querenda sunt balnea, unde communis scola in egritudinibus fortibus balnea consulit cum prius omnia temptarerit medicamina. Quare eorum assumptio plurimum consideranda est."

[92] BN 7357, fol. 100v, col. 1: "Nam de ipsis mineralibus iam complete scriptum est quorum ex notitia quilibet expertus medicus sic componere poterit, verum talis compositio opus est experti medici et doctissimi in arte viri."

[93] BN 7357, fol. 90r, col. 2: "Balnea autem hec vallibus undique sunt vallata a meridionali plaga montibus discooperta. Rus enim fuit condam sanctus bartholomeus nominatum miliaribus xii a civitate distans, nunc vero silvestris et inhabitatus locus est. Verum per nobiles nostros de leone fundatum fuit et in eo in tempore bartholomei templum amplum cui coniunctum est hospitale ad pauperes recipiendos."

On the other hand, a new bath had been discovered in 1448 by its being observed that the cattle who resorted to it for its saltiness were cured of passing blood by drinking the water. The local lord sent a flask of the water to Michael with the request to include an account of it in his forthcoming treatise,[94] the date of which thus seems to be fixed between 1448 and 1450. The commune of Florence had started a third bath at Monte Catino in 1320 in the hope of making money by extracting salt from it, and "not for the safety of mankind." When they found that the expense exceeded the income from it, they abandoned the work.[95] More successful in setting up a salt-works was John de Dondis, of whom we have treated and whom Savonarola calls "a most learned man of ever cherished memory and almost another Aristotle."[96] Savonarola did not agree with him, however, that there was no sulphur in his hot springs, although he appears to have been equally unaware that sulphur is a chemical constituent of gypsum.[97] Besides these commercial ventures, Savonarola informs us that it was the custom to export the waters of certain baths to diverse and distant places in wooden vases. Some thought, however, that the virtue of the waters was weakened thereby or even corrupted so that they might be injurious. Others contended that the waters thus exported retained some of their good effects although not all. Savonarola himself thought that the virtue would be greater at the bath itself before the water cooled off.[98]

As to the cooling off of water Savonarola seems to have cherished a theory rather akin to the old notion that hot water freezes faster than cold. He states that when the water first issues from

[94] BN 7357, fol. 98v, col. 2.

[95] BN 7357, fol. 97r, ". . . per communitatem florentie ordinatum 1320 ut inde utilitatem pecuniosam sibi vendicarent, non ad hominum salutem. Sperabant enim ex ea aqua salsa salis abundantiam habere. Quod cum experti fuerint expensam introitum excedere opus illud relinquerunt."

[96] BN 7357, fol. 86v, ". . . semper recolende memorie vir doctissimus ac prope alter philosophus Iohannes de Dondis patavus iuxta balnea montis groti et balnea sancti petri de quibus infra domum construxit ac instrumenta preparavit ut ex ipsa balnearum aqua salem albissimum conficeret in quantitate notabili."

[97] BN 7357, fol. 84v, De gipso.

[98] BN 7357, fol. 107v, col. 2.

the spring it is clear and limpid to the very bottom. But after standing two days it changes to a green color which is a sign that it has been injured by the chill of the air. It also has an intrinsic tendency to return to the natural frigidity of water. "And here is room for speculation (or, investigation), since hot water reduces itself to greater frigidity than the temperature of its container."[99]

As a matter of fact, this was a question hotly disputed by Savonarola's scholastic contemporaries, including the noted Giovanni Marliani of Milan. A note in a Venetian manuscript of the fifteenth century gives us a vivid glimpse of such disputations.[100] It states that Policletus ex Ferrariis of Mantua, a remarkable doctor of arts, wrote down the following arguments which he had heard from Giovanni Marliani of Milan when he lectured on medicine at Pavia, partly in formal lectures and partly in disputation, and sent them to Giovanni Arnulfo de Arculis of Verona who was teaching medicine at Ferrara with the request that he answer them in order that Policletus might improve his mind and have the opinion of so great a man in these definitions which were touched on in Marliani's arguments. The note then continues that while the rector of the university was arguing concerning the reduction of hot water to frigidity and a certain doctor was replying to him that heated water would cool off of itself intrinsically, Giovanni Marliani who came in at that juncture said: "Hold on! I will prove that heated water does not cool off of itself beyond the degree of cold found in the air containing it. And I will for the present omit the arguments which I am accustomed to adduce concerning the large portion of water which ought to cool off quicker than the small portion, other things

[99] BN 7375, fol. 105r, col. 2. I give the full Latin of the passage, since I am not quite sure if I have translated its meaning exactly. "Nam videmus prima die aquam sic ex fonte venientem claram limpidam usque ad fundum, cum autem stat duobus diebus nec (vel?) circa mutatur ad viridem colorem qui in ea significat iam frigiditate aeris lesam esse quoniam etiam iam ab intrinseco se adiuvat ut ad frigiditatem naturalem redeat. Et est locus speculationis quoniam aqua calida ad maiorem frigiditatem se reducit quam sit frigiditas continentis."

[100] S. Marco VI, 105, large folio, double columns, 15th century, fol. 12r, cols. 1-2.

being equal, which nevertheless is contrary to experiment, also because otherwise all the elements ought to cool off to the degree of cold of that water as I have elsewhere deduced which nevertheless does not seem rational." The other doctor said that he would reply to Marliani's argument the following day, but on the day immediately following he had no effective answer ready. It would seem that Savonarola and Marliani held opposite views on this question.

Michael Savonarola rejected the resort to occult virtues to explain the properties of mineral baths and hot springs. "And in this place," he remarks, "I exclude the opinion of the vulgar who attribute the effects of baths to occult properties."[101] The circumstance that contrary effects were sometimes produced by the same bath, or that in one year a natural spring would induce illness and in another year cure disease, had led many to assign an occult cause and to hold that these properties were from the stars.[102] So many occult qualities were ascribed to the baths de la Poreta, eleven miles from Bologna, that they might almost be called holy and the source of sacred emanations.[103] With such views Savonarola does not agree but holds that all the effects of mineral baths can be explained from their manifest qualities.[104] He affirms that all natural baths produce their effects by their heating and drying properties, and the more so when these are increased by the presence of a hot mineral.[105]

[101] BN 7357, fol. 89v, col. 2: "Et hoc loco vulgarium opinionem excludo qui balnearum effectus proprietatibus occultis attribuunt."

[102] BN 7357, fol. 100v: "Plurimi ex nostris id verum esse opinantur ut balnea ipsa multos effectus mirandos quia (?) subitos a qualitate occulta producant. Nam cum ab eodem sic effectus contrarios producere intuentur, causam aliam quam occultam assignare minime posse iudicant. Adduntque preterea uno anno ac duobus morbosa fore et varias inducere egritudines aliis subsequentibus annis salutifera . . . quam rem non nisi a celesti aspectu pervenire dicunt a quo sic occultam recipiant proprietatem per quam agunt."

[103] BN 7357, fol. 91r, col. 2: "His autem tot attribuuntur laudes totque occulte proprietates ut vere sacerrima dici possint ut et 24^{a} probleumatum probleumate ultimo. Ex eis enim ut fama est sacre operationes emanant."

[104] BN 7357, fol. 100r: "Ego quoque his non assentio sed id verum esse arbitror ut omnes effectus hii a qualitate vel qualititatibus manifestis proveniant."

[105] BN 7357, fol. 89v, col. 2: "Affirmandum secundo balneas naturales omnes ut actum actualiter calefacere atque exicare multoque magis cum ex minera fuerint calidiori."

The fact that Savonarola does not accept the belief that the properties of baths are in the nature of occult virtues and due to the influence of the stars does not mean that he is any less favorable than usual to astrology. For he goes on to say, "That, however, the water of baths is sometimes altered by the stars and sky and made unwholesome I do not deny, but this is a matter for the astronomer."[106] He then mentions the popular notion that all baths lose their virtue in leap-years. He holds that there can be no manifest inferior cause for this, nor does it seem to have a celestial origin but rather to be a human invention. Therefore the common notion seems false. But as Aristotle remarks in the second book of the *Ethics,* popular report which is generally held cannot be wholly mistaken, since it follows a celestial impetus. Moreover, Savonarola admits that in leap-years vegetation suffers noticeably, pregnant women bear weaker offspring and more die, and other animals are less pregnant than usual. Therefore it is not unreasonable to conclude with the man in the street that the cause of these effects is occult and supercelestial.[107] Savonarola therefore sets out to evolve a satisfactory explanation for these phenomena, as he rates them.

There is probably a connection between these changes every fourth year and the fact that there are four elements, qualities, and humors. But the elements, qualities, and humors are themselves too variable and subject to change to produce so regular an effect, which is rather to be referred to the superior bodies with their orderly action.[108] Further, it is probably due to Saturn which is the planet most hostile to life and birth, as is shown from the fact that the child born in the eighth month, which is under the rule of Saturn, does not live. For this well known astrological theory that the child born in the eighth month does

[106] BN 7357, fol. 101v, col. 2: "Quod autem aqua termarum quandoque a stellis et celo alteretur fiatque morbosa non nego sed hec indagatio astronomi est."

[107] For the discussion since the previous footnote see BN 7357, fol. 102r, col. 1.

[108] BN 7357, fol. 102r, col. 2: "Et cum hanc rem ab his elementis aut qualitatibus humorum sic semper similem fieri putandum non sit ob varias et continuas in his mutationes inferendum erit a superioribus hoc contingere quibus ordo actionum est regulis."

not live, Michael cites especially the 163rd of the *Problems* of Alexander Aphrodisias.[109] The importance of the number four in this connection is also not to be minimized, although Michael would not have anyone think that by his insistence upon it he wishes to deny the particular influences of the heavens.[110] He thereupon devotes considerable space to stating the general claims of astrology and arguments in its favor.[111] Authority[112] and experience are both on its side. Order and subordination of inferiors to superiors are as necessary in the natural universe as in political and economic life. God created the heavens first because he wished all creation to be ruled by the sky. Savonarola is careful to save free will, however, and touches on the remark of Dionysius the Areopagite anent the eclipse during the crucifixion.

Savonarola then returns to his combination of Saturn and the number four as a hypothesis to explain why leap-years are unfavorable to generation, vegetation, and the medicinal virtues of mineral baths. As the moon acts regularly on the tides, so the humors of the body are probably moved by other planets. Phlegm is moved "every day and in the evening," the blood is moved "every day and in the morning"; cholera is moved every third day, and melancholy every fourth day.[113] Savonarola therefore infers that the blood is moved by the sun, cholera by Mars, and melancholy by Saturn. What is true for days is probably also true for years, since the motion of the planets is measured by years as that of the humors is measured by days. And as every third year choleric fevers are multiplied, so every fourth year is probably melancholic and under the influence of

[109] BN 7357, fol. 102r, col. 2, and again at more length on fol. 103r, col. 2.

[110] BN 7357, fol. 102v, col. 1: "Non est itaque hic quaternarius numerus faciliter negligendus quod additur propter rei novitatem. Neque putet quisquam ex his me velle negare influxus celi particulares."

[111] BN 7357, fols. 102v, col. 1, to 103r, col. 1.

[112] Aristotle is cited in favor of astrology as follows: "Methaurorum primo. Necesse est hunc mundum superioribus lationibus esse contiguum ut virtus inde habita gubernatur. 8 Phisicorum. Primum mobile vita est inferiorum. Et in 2° dicere ausus est, Sol et homo generant hominem."

[113] BN 7357, fol. 103r, col. 1: "colera moveatur de tertio in tertium, et melancholia de quarto in quartum, flegma omni die et sero, sanguis omni die et mane."

Saturn which is cold, dry, and contrary to life. Shepherds tell us that their herds fall off in these years, and it is evident that in human childbirth there are more cases of abortion and weaker babies, while plants either produce no fruit or less than usual. Furthermore quartan fevers are apt to be multiplied in that year, "as I observed in my time at Ferrara."[114]

Savonarola's discussion of natural baths involves, as we have already seen, some treatment of the minerals and metals contained therein. He thus occasionally touches upon the fields of mineralogy, metallurgy, and alchemy. Indeed, he tells us that he had composed a distinct treatise on *aqua ardens* or alcohol.[115] He distinguishes between salt from the Mediterranean sea and from the ocean.[116] To those who thought that they detected the odor of camphor in certain natural baths he explains that camphor is the gum of a tree and not a mineral.[117] He states that among men of old copper was known before iron.[118] Because of iron's great utilities he objects to ranking it the lowest of metals. He lists various substances which rust iron such as blood and discusses how to prevent its rusting, but his information concerning the working of iron does not seem very advanced.

In evaporating the water from natural baths in order to sequester the minerals or other foreign substances contained in them in the form of a residue and deposit, many preferred the process of boiling, and even John de Dondis seems to have been of this opinion.[119] Savonarola, however, preferred the gentler application

[114] It is in this connection that the date 1460 is given—BN 7357, fol. 103r, col. 2: "Infertur secundo hoc eodem anno febres quartanas multiplicari ut meo tempore vidi Ferraria 1460 plurimas et plurimas regnasse quartanas." As has been observed earlier in another connection it sounds unnatural for Savonarola to say "as I observed in my time" of an event as late as 1460, although it would not be unnatural for him to use it in 1460 in his old age of some earlier event during his prime of life—say soon after he came to Ferrara in 1440.

[115] BN 7357, fol. 108v, col. 2: "ut docui in libello quem de aqua ardenti composui." For editions of it see above, p. 188, note 30.

[116] BN 7357, fol. 82v.

[117] BN 7357, fol. 98v, col. 1.

[118] BN 7357, fol. 85r, ". . . apud veteres nostros de ere prior fuerit notitia."

[119] BN 7357, fol. 108v, col. 1: "Et si vera sint que scripsimus, multis tamen placuit magis ebulitio quam elambicatio cum sit operatio caliditatis fortior sic eterogenea melius sequestrans. Cui opinioni adherere videtur Johannes de Dondis supra."

of heat known as alembication, in which a lamp was lighted under a glass vessel, and the water was distilled slowly. He felt that experience showed clearly that in strong boiling the finer solid particles ascended more than in alembication, especially when the latter was gentle.[120] When the evaporation was complete, the solid deposit was removed from the alembic and dried, by some in the shade, but Savonarola preferred to do it in the sun which coagulated the salty and nitrous parts so that they could be more readily discerned and illuminated the sulphurous portions and rendered them more shiny.[121] He adds the information that salt may be distinguished from soda and rock salt by their degrees of lucidity, that soda has a sharper taste than salt and is harder to the touch, that salt crackles when thrown in the fire while soda and rock salt do not. Savonarola notes similar differences between other minerals, and draws the conclusion that specialized knowledge is necessary for the investigator of the minerals in mineral baths, especially in those matters which are comprehended by the senses.[122] Thus an approach to scientific chemical observation is being made.

Savonarola accepted the doctrine that the various metals were formed by nature from quicksilver and sulphur,[123] but he held that art was weaker than nature, and that the alchemists could not transmute one metal into another. He thought that they had been led to believe in transmutation by their success in obtaining salt (sal ammoniac?) from urine.[124] But they cannot alter

[120] *Idem,* "Sed certa experientia docet quod in forti ebulitione partes terree magis ascendunt quam in elambicatione precipue cum suaviter fit (col. 2) ut docui in libello quem de aqua ardenti composui. Nam cum licinio lucerne ardentis conficitur, fit enim ita suavis calefactio ut subtiles partes exalent terrestribus parum molestatis. Equidem expertus sum in ebulitione quod partes pauce terre remanent, unde plus placet elambicatio."

[121] BN 7357, fol. 108r, "Nam sic partes salsose et nitrose a sole coagulantur qua ex re melius discernuntur et partes sulfuree illuminantur et splendidiores redduntur."

[122] BN 7357, fol. 108v, col. 1: "Quibus accipiatur quantum necessaria est indagatori minerarum mineralium termarum exquisita notitia precipue ad eas partes que sensibus comprehenduntur."

[123] BN 7357, fol. 85r, he remarks of iron, "Generatur autem ex argento vivo terrestri ponderoso luculento valde immundo et ex sulfure immundo terrestri sulfure dominante."

[124] BN 7357, fol. 82v, "Contingit et ex urina hominis et precipue puerorum

forms, or change species. Savonarola does not believe it possible that specific difference can be removed by any ingenuity, or that one *complexio* can be turned into another. The alchemists can only affect color, vapor, weight, appearance, and accidental properties. The difference between species and *complexiones* is unknown to men; therefore how can they possibly know how to go to work to get rid of it?

In his treatise on *aqua ardens,* however, Savonarola twice cites "that divine man, Raymond" Lull and furthermore declares that the art of alchemy is most true, but that the ignorance and avarice of its practitioners make it seem false, since they conceal their processes from other men under unknown nomenclature and terminology.[125] But as we have already seen, he did not identify alchemy with the attempt to transmute metals but used the word in a broader sense. The earlier writer on baths, Ugolino of Montecatino, had been more favorable to transmutation. He not only spoke of "the divine effects of alchemy," but added, "For we see that from copper, sulphur, and quicksilver, and other minerals, species are transmuted into gold and silver."[126]

There are traces of more superstitious beliefs than astrology or alchemy in Savonarola's treatise on baths. He was nearly suffocated when an associate endeavored to drive evil spirits from a woman by holding her over live coals on which sulphur had been sprinkled and crying, "Depart ye in the name of our Lord Jesus Christ."[127] And he states that the citizens of Catania, when threat-

salem fieri per operationem alchimie. Nam urina ut sal mordet et urit et a natura salis non multum distans est, quare ex uno in aliud facilis est transitus per decoctionem cum sal calidior sit urina et siccior, et sic per actionem caloris urina in salem convertitur. Et ex hoc accipe errorem alchimistarum formarum distantiam ignorantium qui ignorantes quod ille transitus est impossibilis enituntur tamen formas disperatas sic alterare ut opinantur ab una in aliam transitum fieri posse ut stannum in aurum converti." A little later, having said that lead treated by alchemists "will always be lead, although it may seem silver," Michael adds: "Sed obtinebunt in eo qualitates aliene ut errent in eo homines ut qui accipiunt salem et salem armoniacum."

[125] Passage quoted, in Italian translation, by Carbonelli (1925), p. 10, from MS Bibl. Casanatense, Rome, 1232, p. 10. Ed. of Basel, 1561, p. 246; for the citations of Raymond, pp. 243, 297.

[126] *De balneis,* Venetiis apud Iunctas, 1553, fol. 48r.

[127] *Ibid.,* fol. 11v, col. 1.

ened by the fires of Aetna, drive them in the opposite direction by bearing the relics of Saint Agatha in procession.[128]

Savonarola's work on baths appears to have become well known and influential. It headed the Junta collection of 1553 and was frequently cited in such a subsequent work on the same subject as that of Menghus Blanchellus, completed in 1513,[129] while Fumanelli opened his treatise by complaining that Michael had not said a word of the baths in Veronese territory.[130] A copy of the 1485 edition of Savonarola's work on baths was included in the library of Pico della Mirandola,[131] and if it did not contain the *Physiognomy* as well, this was presumably because it existed only in manuscript and was more difficult to procure.

[128] *Ibid.*, fol. 10r, col. 2.
[129] *Ibid.*, fols. 58r-86v, Menghi Blanchelli Faventini de balneis tractatus.
[130] *Ibid.*, fols. 183r-189r, Antonii Fumanelli medici Veronensis de balneorum aquę ferratae facultatibus et prȩsertim Calderianae.
[131] Calori Cesis, *Pico della Mirandola*, Mirandola, 1897, p. 51.

CHAPTER XLVII

ANTONIO GUAINERI

Antonius Guaynerius or Antonio Guaineri is called "of Pavia" in the manuscripts and editions of his works. From the records of that university we learn that he lectured on medicine there in the early afternoon in 1412-1413 for one hundred and twenty florins, and in 1448 gave the ordinary lecture in medicine in the late afternoon at a salary of three hundred florins with prospect of twenty-five more for the next year.[1] In the same year, 1448, a meeting to protest against the admission of a foreigner to the college of arts and medicine was held at his house at Pavia.[2] Some of his medical works were addressed to Filippo Maria, duke of Milan, one to the ducal chamberlain, Andrea de Birago, and others to Antonio Magliani of Chieri, physician to the duke of Savoy, to whom Guaineri addressed his work on pleurisy and to whom he sent his treatise on fevers from Chambery.[3] As this suggests, Guaineri spent a portion of his career in Savoy and Liguria, presumably sometime between the years 1413 and 1448. In the preface to his pest tract he appeals to the duke of Milan,

[1] R. Maiocchi, *Codice diplomatico dell' università di Pavia*, Pavia, 1913, II, 123, 538-539.
[2] *Ibid.*, pp. 534-535. Neuberger, *History of Medicine*, II (1925), 128, is therefore not quite accurate in placing his death about 1445, in which he perhaps follows the statement of Pansier, *Archiv f. Gesch. d. Medizin*, II, 21, that Guaineri died after 1445 or Chevalier's dating him as a physician at Pavia from 1412 to 1445. Sudhoff's placing his death in 1440—*ibid.*, XVI, 117, "Antonio Guaineri aus Pavia, der 1440 als Paduaner Professor gestorben sein soll"—does not agree with his other statements concerning him, so that 1440 should perhaps be regarded as a misprint for 1448, although that, too, would seem too early. Exception must also be taken to Sudhoff's assertion (*ibid.*, XVII, 243), "dass Guaineri nach dem Tode seines Gönners Amedeo VIII di Savoia 1445 sich an den Hof des Duca Lodovico di Savoia nach Turin zurückgezogen haben soll," since Amadeus, elected antipope at Basel in 1439, did not die until 1451.
[3] Vendôme 107, fol. 1, "in villa Chiambariaci"—a better spelling than Sudhoff's *Crambraiaci* in *Archiv*, XVI, 118, or the *Cambaraccii* of Vatic. 2482, fol. 216r. For the other works see Appendix 46.

as "the light of Italians," to save "our Liguria," once most happy but now down-trodden and devastated. He also makes various allusions to Savoy and to "this side of the mountains" in opposition to Italy which indicate that he was then beyond the Alps. He appears to have taught not only at Pavia but at Chieri to which the university, founded at Turin in 1405, was transferred in 1421, to be transferred again to Savigliano in 1434.[4] His treatise on baths is limited to those of Acqui in Montferrat.[5]

Our discussion of Guaynerius will center especially about his double treatise on the pest and poisons, with occasional reference to his other medical works. In opening his account of diseases of the head he tells us that he had decided not to wait to complete a *Summa* concerning all diseases but to publish each section as he finished it lest death overtake him before the completion of the whole. His works as contained in the *editio princeps* of Pavia, 1481, and the later edition of Venice, 1500,[6] comprise the account of diseases of the head, treatises on pleurisy, stomach complaints, intestinal disorders, diseases of women, a double treatise on diseases of the joints and the stone, the double treatise on pest and poisons, a tract on fevers, a tract on the baths of Montferrat, and an *Antidotarium*. The work on pest and poisons was composed before 1440, since in that year a copy of it was made by Nicolaus Ofhuys of Amsterdam,[7] and there are other extant manuscripts of 1440 and 1442. In addition to the full version of his treatise on the pest and poisons as printed in the 1481 and 1500 editions of his works, Guaineri

[4] H. Rashdall, *The Universities of Europe in the Middle Ages,* Oxford, 1895, II, i, 56-57.

[5] *Antonii Guainerii De balneis Aquae civitatis . . .*, in the collection, *De balneis,* Venetiis apud Iunctas, 1553, fols. 43r-45v, opening, "Quia nonnulli Viri doctissimi balneorum quorundam in Italia existentium. . . ."

[6] Both editions have been consulted in the Edward C. Streeter collection at the New York Academy of Medicine. See Appendix 46 for further details.

[7] Leipzig, university library, 1167, fols. 1-55: described by Sudhoff, *Archiv für Geschichte der Medizin,* XVI (1925), 117-118, who also lists Vatic. 2482; CLM 184, 1440 A.D., fols. 162-207; CLM 205, 1442 A.D., fols. 61-95, de venenis (but according to the catalogue these fols. are occupied by Guaynerius de propriis mulierum aegritudinibus, his De pestilentia beginning at fol. 95 and De venenis at fol. 105); Breslau, university library, III.T.11. For other MSS see Appendix 46.

composed a second briefer version which is also addressed to Filippo Maria, probably with the intention, like that of Roger Bacon in *Opus minus* and *Opus tertium,* of reminding the duke of his existence and with the hope of inducing him to read at least the shorter version. The literature of contagious and suddenly fatal diseases, like that concerned with the mysterious action of poisons, has a specially close relation to the occult and to sympathetic magic. In Guaynerius we have an illustration of this and of the broader status of medicine in the first half of the fifteenth century. Although in a sense the discussion of pest and poisons constitutes one treatise, it will be clearer if we refer to the two parts distinctly.

For his pest tractate Guaynerius claimed a certain novelty. It is true that he assures us that he has ventured to set down nothing of his own, although he might have done so freely had he followed the practice of others, unless he had confirmed it by the opinions of authorities, and by the reasons and experiences of the greatest men. But he then goes on to assert that no previous writer on the pest had ever composed a systematic treatise, whether because the disease was too perilous to observe or because such devastating diseases were rarer in former ages.[8] Neither of the two last reasons sounds convincing; in the first place because pest tractates had been numerous during the years between 1348 and Guaynerius' own time, however rare or frequent they may have been before 1348; in the second place, because earlier writers on the pest like Gentile da Foligno had both written on it and died of it. But possibly we can accept Guaynerius' claim to the extent of regarding his work as fuller, more systematic, and more exhaustive of previous literature on the subject than were the works of his predecessors. That he regarded the frequent pestilences of

[8] *De peste,* Preface: "Ego autem nihil proprii ausus inscriptum volui quod more quamplurimorum licenter facere potuissem ni fuerit sententiis auctoritatibus rationibus et experimentis amplissimorum virorum vallatum quibus hec ipsa precepta munire opere pretium existimavi tum maxime quod nullus qui de hac tam necessaria morbi materia ante hoc tempus conscripserit quicquid ordinate relinquere documenti inventus sit, aut quia astantibus periculosa nimium visa esset aut quia superiori etate tam immitissimi morbi rariores apud homines usus fuissent."

his time as a serious obstacle to scientific writing is shown by a passage in his treatise on baths in which he states that, while some baths of Italy are widely celebrated, no writing is found concerning others because of wars and the pestilences that occur so often.[9]

Among the various authorities whom Guaynerius cites in the pest tractate one of the most recent is Gui de Chauliac's work on surgery,[10] but various fourteenth century medical writers are also mentioned. He maintains an attitude of some independence towards previous writers. Thus he disagrees with Gentile da Foligno and Marsilio of Sancta Sophia, holding that Avicenna meant the cardiac vein where they had advised to bleed from the basilic.[11] He marvels that Gilbert of England, "who was a great experimenter," should have given vitriol mixed with water in a desperate case, since it contains poison. He grants, however, that one poison sometimes dispels another.[12] He observes that Gentile da Foligno and Ioanninus de Sartirana need not have engaged in controversy with each other and with the 93rd *Differentia* of Peter of Abano's *Conciliator,* had they noted the solution of the question in dispute in the same Peter's work on poisons. In which connection Guaynerius speaks of Abano as "ille sollemnis speculator."[13] In the work on poisons Gentile is cited concerning the latitude of the human *complexio,*[14] while reference is continually being made to Conciliator's opinions as to poisons. Guaynerius does not always agree with these, however. In the mountains of Saluzzo and Pignerol they make a poison from the root of an herb which they call *napellus* (aconite) and poison arrows with it to kill wild goats. Yet, contrary to the view of Conciliator, the flesh of the animals so killed is not poisonous to eat but all the tastier for it in their estimation.[15] If these

[9] *De balneis,* cap. 1, "Sunt item alia de quibus tum propter guerras tum propter evenientes tam frequenter pestes apud modernos nulla scriptura reperitur."

[10] *De peste,* II, ii, 3, "Amplius recitat Guido de caliato in tractatu suo de cirurgia capitulo de apostematibus pectoris in translatione ad mortalitatem quod est de intentione."

[11] *Ibid.,* III, 3.

[12] *Ibid.,* III, 5.

[13] *Ibid.,* III, 1.

[14] *De venenis,* cap. 4.

[15] *Ibid.,* cap. 1, Dubium 3. "Ex istis infero quod non omne cadaver factum ex veneno est venenosum ut dixit Conciliator."

hunters accidentally wound themselves, they know an herb which counteracts the effect of the *napellus.*[16] Arnald of Villanova, Simon of Genoa, Taddeo Alderotti of Florence, Gerard of Cremona, Albertus Magnus, and Avicenna are other examples of the past authors utilized by Guaynerius. Albert is cited concerning the child which at every opportunity would run off to the corners of the rooms of the house and eat spiders,[17] a practice which cannot be considered a testimonial to the thoroughness of its medieval mother's housecleaning.

Besides citing medical writers of the later middle ages, Guaynerius, especially in his pest tract, sheds some light upon contemporary medical and surgical practice, both learned and popular. The physicians of Paris, he says, opposed the use of cautery and bleeding in the bubonic plague on the ground that it weakened the patient's power of resistance.[18] However, Guaynerius had seen a smith at Chambery who cauterized a bubo in the groin with tenacula and recovered.[19] He quotes a surgeon with whom he had talked who had lived long among the Saracens,[20] and mentions the cures of pest cases wrought during the past year by a surgeon of Dauphiné who was illiterate "but a great experimenter."[21] The surgeon who had long lived among the Saracens is again cited in the second part on poisons, this time for the statement that the sultan had so fortified himself with antidotes that he feared no poisons.[22] It is not clear whether Guaynerius refers to this same surgeon or to some other when he says that he has seen an old surgeon who preserved a youthful appearance because he ate the flesh of venomous serpents as we eat eels.[23] In the chapter on the cure of small-pox Guaynerius warns never to apply a poultice in certain cases, which advice he reinforces by the example of a Jew who, with slight regard

[16] *Ibid.,* cap. 3. This poison has of course come into our previous chapters.

[17] *Ibid.,* cap. 4.

[18] *De peste,* III, 4 and 5.

[19] *Ibid.,* III, 4: "Vidi namquam quendam fabrum Chianberiaci qui cum tenaculis. . . ."

[20] *Ibid.,* II, ii, 3.

[21] *Ibid.,* III, 4.

[22] *De venenis,* cap. 4.

[23] *Ibid.,* cap. 3.

for the heart, applied a poultice to a sufferer from small-pox in whom signs of safety were beginning to appear. "And on the morrow he died of suffocation."[24] The story bears a general resemblance to that of the foolish prescription in a different case recounted by Guaynerius's contemporary, the surgeon, Leonard of Bertipaglia.[25] Of quacks and popular practitioners Guaynerius gives another glimpse in telling of "some shysters" whom he saw curing poisonous bites "for pay and the sake of St. Paul."[26] But they, too, gave experimental proof.

In the collection of manuscripts at Vendôme are preserved some medical works which had formerly belonged to Theodore Guaynerius of Pavia, a descendant of Antonius. Since they are manuscripts of the fifteenth century, we may perhaps infer that Theodore had received them from Antonius of some of whose medical treatises he possessed an autograph copy. They comprise the *Colliget* of Averroes, a commentary of Marsilius de Sancta Sophia on Avicenna, and recipes for stomach disorders written down by a Nicolaus de Rubeis in 1440.[27]

In both of his works addressed to Filippo Maria, Guaynerius refers in eulogistic terms to two doctors of arts and medicine as his dearest teachers and as body physicians to the duke of Milan. These men were Luchino Bellocchio and Giovanni Francesco Balbi. They are mentioned in the preface to the work on diseases of women[28] and are apostrophized in closing the work on pest and poisons.[29] The names of both also appear frequently

[24] *De peste*, III, 6.

[25] For it see my *Science and Thought in the Fifteenth Century*, 1929, pp. 73-74, 276.

[26] *De peste*, II, ii, 3: ". . . Et ego nonnullos truffantulos vidi qui pro gratia sancti Pauli vendunt et post morsuram venenosorum cum pauco vini exhibent et cuilibet morsure veneno se resistit ut ipsum experimentaliter ostendunt." Just what they sold and applied with a little wine is not quite clear; perhaps a word or two has been dropped out in the printed editions. From the context I should infer that it was the herb *scabiosa*.

[27] See the notices of MSS Vendôme 233, 244, 245 in the *Catalogue Général etc.: Départements*, vol. 3. Perhaps this Nicholas was related to the astrologer, John de Rubeis, whose predictions we have discussed in an earlier chapter.

[28] BL Canon. Misc. 29, 15th century, quarto minori, fol. 2v, ". . . peritissimis illis meis dilectissimis preceptoribus magistris Luchino veloculo et Johannifrancischo balbo qui tue vite curam habent."

[29] Vatic. 8759, fol. 94r, "Unde vos insignes artium et medicine doctores magistri luchine de beloculis et iohannes francisce de balbis mei dillectissimi preceptores qui prefati domini gubernationes presentialiter bonos geritis ipsum benivola mente super (semper?) suscipite."

in the records of the university of Pavia from the last decade of the fourteenth century on.[30] Luchino received the licentiate in medicine in 1390, and in 1403 after twelve years of teaching at Pavia and Piacenza he became involved in a dispute whether he should give up his lecture room to a member of the law faculty.[31] He died in January 1440, before which date Guaynerius must have written both the above mentioned works. Balbi was still alive in 1450. Both men appear to have ceased teaching at a fairly early date, probably because their presence was required at Milan as ducal physicians. Luchino's name appears on the extant faculty lists for the last time in 1408; Balbi's in 1415.[32] It was also by the advice of a master Luchino, whom he described as "a man very expert in our art" and who presumably was no other than Bellocchio, that Guaynerius administered heroic, or what today would be regarded as brutal and unfeeling, treatment to a lady of Savoy who had gone mad. He tells of it in the section of his work on diseases of the head devoted to melancholy and mania.[33] In yet another passage he mentions Balbi, "once my most worthy preceptor," with two other "most learned and illustrious students of physic," Petrus de Monte and Stephanus de Burgo as ducal physicians.[34] Guaynerius also refers to James of Forlì as his master. James had seen a stone generated under the tongue of a certain Nicolaus de Summa rippa.[35]

This reflection of contemporary life extends to other fields than medical practice. Thus in the pest tract Guaynerius tells

[30] *Codice diplomatico dell' università di Pavia*, Pavia, 1905, 1913, 2 vols.: consult the indices of both volumes under Balbi and Bellocchio.

[31] *Ibid.*, II, 28-30.

[32] From 1409 to 1412 the lists are missing.

[33] *De egritudinibus capitis*, XV, 8. It will be given more fully below.

[34] *Opera*, Venice, 1500, fol. 95r, col. 1, Preface of the *De peste:* ". . . doctissimis et clarissimis physice contemplatoribus magistro Ioanni Francisco Balbo meo olim dignissimo preceptori Petro de monte arano et Stephano de burgo quos sui vite custodes invenies." The reading is the same in the edition of Pavia, 1481.

[35] *Ibid.*, fol. 89r, col. 2, from the treatise *De calculosa passione*.

how he saw fishermen at Venice use the same fish in one month and reject it the next as being too thin or too fat.[36] In warning against heavy wines in time of pestilence he states that the Italians take them with water before meals while "those this side of the mountains," i.e., in Savoy and Dauphiné, follow the opposite practice of taking them at the end of the meal, a custom which some medical writers and even modern ones defend. But Guaynerius prefers the Italian procedure.[37] Have we here the fifteenth century precursors of cocktail and cordial? In the work on diseases of women he tells an anecdote reflecting the contemporary suspicion of the chastity of the Franciscan friars.[38] In the treatise on poisons he states that a Hindu who is transported by stages or degrees to the land of the Slavs is so gradually acclimated "that he does not fear the action of the air there, as experience teaches."[39] Something approaching an international and world-wide viewpoint thus characterizes our physician of the fifteenth century.

Since the time of the Reformation, and still more since the publication of *The Origin of Species,* both Protestant and Catholic writers on primarily secular matters such as politics, medicine, and natural science, have ceased to open and close their works with prayer or interlard them with pious ejaculations and devout phrases as they did in the days before the separation of church from state—and from most everything else in this life. Antonius Guaynerius, however, was distinctly of the old school in this respect and thinks nothing, especially in his pest tractate where perhaps the prospect of sudden death has some influence, of interrupting the flow of his medical discourse to address Christ and the virgin. The following is an example from the chapter on pharmacy and phlebotomy.

Thou, therefore, good Jesus, who hast never deserted me in my hour of need, aid in what I have undertaken and so bathe my weak mind in

[36] *De peste,* II, i, 8, "De piscibus."
[37] *Ibid.,* II, i, 10, "De potu."
[38] BL Canon. Misc. 29, 15th century, fol. 110r-v. Vatican 3163, fols. 11r-80v, is another MS of this work. See my "Vatican Latin Manuscripts in the History of Science and Medicine," *Isis,* XIII (1929), 73-74, note 9.
[39] *De venenis,* cap. 4.

thy heavenly dew that I may have strength to indite such remedies as those using them may safely guard themselves from a disease so terrible, fierce, and most rapacious. Amen.[40]

In his discussion of poisons Guaynerius continues the tradition which we have already observed in works upon that theme of the later fourteenth century, some of which had further resembled his in being addressed to dukes of Milan. Of these he cites Christopher de Honestis "in his problems regarding poisons," but his chief authorities on the subject are Avicenna and Peter of Abano who is usually cited as "Conciliator." He refers also to such authors and writings as Rasis to Almansor, Simon (Cordo) of Genoa's *Synonyms,* Gilbert of England, Albertus Magnus, Arnald of Villanova, and to such pseudo-literature as the *Book of Secrets* of Galen, or the *Secret of Secrets* of Aristotle.[41] Indeed, he displays a very broad acquaintance with the medical writers of the centuries immediately preceding, showing us what wide readers men could be in the days before the printing press. Other than medical works are sometimes used, as when Orosius and Boccaccio are quoted concerning Mithridates.[42]

Guaynerius in particular continues the tendency to put problems or questions concerning poisons and to discuss these scholastically. He devotes his opening chapter to six such *dubia,* but then, although many more occur to him, he thinks it time to turn from theorizing to practice[43] in the remaining eleven chapters.[44] He sometimes argues in scholastic fashion in these too, however.[45]

[40] *De peste,* II, ii, 1.
[41] For citations of these works in the order named see Vatic. 8759, fols. 32v, 35v and 38v, 41v, 8v, 38v, 91v, 36r. While I shall usually cite the *De venenis* from this Vatican MS, I have compared my notes on it with the printed editions and found the corresponding passages there too. For a few passages which have been drawn from the printed text since the manuscript left my hands the citations are given by chapters.
[42] *Ibid.,* fol. 35v.
[43] Vatic. 8759, fol. 17r-v, his second chapter opens: "Multa michi circa venenorum materiam dubia occurrunt quorum declaratio nixi theorizantibus modicam affert utilitatem. Et quia ut plurimi in ista legentes materia statim ad practicam partem de theorica non multum curantes vellent devenire preservativum regimen christo auviliante deinceps describam."
[44] His table of contents is reproduced in Appendix 47.
[45] See cap. 4.

Much the same mineral, vegetable, and animal poisons are listed as in previous treatises; and fungi and mad dogs are discussed in similar style. Guaynerius, however, likes to recount his own or other recent experience. Now he tells us of an emerald which he has often bound on the abdomens of patients and never failed to find it give relief.[46] Now he confides that pork once used to poison him but no longer has that effect.[47] Now he mentions the invention of a new variety of theriac by a physician of Pavia.[48]

But for us the salient feature of Guaynerius's work is its affirmation of occult influence. This comes out in his very definition of poison as having an occult action.

> Although poison may be defined in many ways, I here understand by poison that alone which, however it may be administered to the human race, whether it has been operated by matter or not, is corruptive of its *complexio* by means of a certain occult property.[49]

Guaynerius rejects the distinction which some have drawn between poisons that act by a manifest quality, such as heat or cold, and those that act by an occult quality. For him all poisons act by an occult property. Not that occult virtues are in any way limited to poisons. "O good God," exclaims our author in one passage, "how many virtues emanating from the whole substance have you sealed in things, but which remain unknown to us!"[50] The same thought is repeated in much the same words in his work on diseases of the head in the section on epilepsy[51] and in his pest tractate.[52] In his pest tractate Guaynerius also sets great store by bezoars. He believes that tyriacs and bezoars

[46] Vatic. 8759, fol. 25r.
[47] *Ibid.*, fols. 39v-40r.
[48] *Ibid.*, fol. 50r.
[49] Vatic. 8759, fol. 5r: "Etsi venenum multipliciter accipi potest hic per venenum illud solum intelligo quod qualitercumque humano generi (*corpori* in eds.) aproximatum sive a materia operatum fuerit sive non est sue complexionis quadam mediante occulta proprietate corruptivum."
[50] *Ibid.*, fol. 90r, "O bone deus quot virtutes a tota substantia provenientes in rebus sigillasti que nobis existunt incognite."
[51] *De egritudinibus capitis*, VII, 4, "Quot enim proprietates rebus insunt que adhuc nobis existunt incognite."
[52] *De peste*, II, ii, 3: "O quot et quantas gloriosus iste Iesus de Nazareth proprietates rebus imposuit que adhuc existunt nobis ignote."

have been discovered by divine inspiration rather than human reason. Such inspiration and experimental discovery are, however, closely associated in his mind. Thus he states that many moderns by such inspiration have found by experiment remedies against the pest "unknown to our ancestors."[53] For experience is master. He also sets forth, however, bezoars whose virtues he has found "written in a certain most ancient book."[54]

Occult virtue plays a large part in the theoretical problems of Guaynerius's opening chapter on poisons, although the ensuing discussion tends considerably to reduce its scope and field. This first question, whether a deaf or blind man can be poisoned by a basilisk, involves the point whether one can be poisoned through the senses of sight and hearing. Although other authors had so held, Christopher de Honestis had already denied that such an occult property could inhere in the visual spirits. Guaynerius further argues that a basilisk poisons equally well without hissing, with its eyes shut, or even after it is dead. The venomous vapors which it emits transmit the poison.[55] The fifth *dubium* is whether, other things being equal, a poison is more effective acting intentionally or spiritually or materially. Avicenna's credence in the force of strong imagination on an alien body is mentioned, but only as "superstitious and to be utterly rejected" and "against our true and most holy Faith."[56] Then the question is raised whether a poison can be so administered that the victim will die at a set future time and not before or after. This Guaynerius denies, although he grants that some poisons act more slowly than others. But in his opinion it is impossible to time the action of a poison at all precisely in any particular case, since different persons are very diversely affected by the same dose.[57]

Guaynerius nevertheless believes in poisons which consume

[53] *De peste*, Preface.
[54] *Ibid.*, II, ii, 1: ". . . et ideo aliqua bezardica tam simplicia quam composita ponam tam a priscis quam a modernis in hoc casu experta philosophis, alia ac etiam subiungam quedam quorum virtutes in quodam antiquissimo libro scriptas inveni."
[55] Vatic. 8759, fols. 10v-11r.
[56] *Ibid.*, fols. 15v-16r.
[57] *Ibid.*, fols. 15r-16v.

a person gradually, so that his natural heat which otherwise would have sustained life for, say, forty years will be exhausted in a year or two.[58] He also believes that the action of certain poisons may be delayed. Thus the symptoms of hydrophobia may not appear until forty days or even six months or a year—some say seven years—after a person has been bitten. Indeed, Guaynerius had himself heard from a trustworthy source that a man became afflicted with hydrophobia eighteen years after he had been bitten. This was the result of his passing beneath the shade of a sorb tree; within three days thereafter he died mad.[59]

In his pest tractate Guaynerius displays faith in ligatures and suspensions or the external application of remedies which it might be thought would need to be taken internally to produce any effect. He testifies to the virtue of a solutive medicine applied as a plaster below the navel[60] and had seen the physician of the duke of Savoy loosen the bowels by pills held in the hand as quickly as if taken internally.[61] He even went farther than this and recommended the wearing or the carrying with one of letters and prayers. He gave this a devout turn, however, by adding that the glorious Jesus of Nazareth had granted such marvelous powers to His saints, like Anthony, Sebastian, and Christopher, that if any person had firm hope in one of them and reverently, devoutly, sincerely, and purely carried something on his body in the nature of prayers to or relics of the saints, there was no doubt but that he would escape the pest.[62] Such a prayer against the pest is added in a later inferior hand in one of the two Vatican manuscripts at the close of the treatise on poisons.[63]

Faith in the marvelous virtues of gems is also maintained by Guaynerius. He believes that a jacinth worn about the neck acts upon the heart, and an emerald upon the eye of a toad.[64]

[58] Vatic. 8759, fols. 16v-17r.
[59] *Ibid.*, fol. 90r.
[60] *De peste*, III, 4: "Nec de hoc admirari debes quia medicina solutiva sub umbilico emplastrata ventrem solvit ut nonnumquam de mercuriali pueris sub umbilico emplastrata experimento cognovi."
[61] *Idem.*
[62] *De peste*, II, ii, 4: "De his que sunt ab extra approximanda."
[63] Vatic. Palat. 1214, fol. 70r.
[64] Vatic. 8759, fol. 6r.

He recognizes that many persons have lost faith in such effects from precious stones, but repeats the explanations of Albert and others why gems sometimes seem to lack the marvelous powers attributed to them, and some favorable experience of his own with them.[65] He also recommended certain gems against the plague in the pest tractate and cited Albertus Magnus concerning three species of carbuncles. It was his opinion that a stone having virtue against aerial poison would be a wonderful preservative from the pest if engraved with a human figure girded by a serpent whose head was held in the figure's right hand and the tail in the left.[66] In a later passage of the work on poisons he tells how a king of France escaped from being poisoned by placing an emerald under one foot which was scarified a little. The emerald drew out all the poison through the scarifications and thus the king was saved.[67] If a stone is worn thus in a ring, the finger will burn at the approach of poison.[68] Another stone is so beneficial that toads kiss it.

Another anecdote leads us on from the virtues of gems to astrology. A Spaniard told Guaynerius of a king who found out the nativity of a rival monarch who was inclined to be hostile. He then sent him a present of a saddle richly adorned with gems whose occult properties, exactly suited it would seem to the other king's nativity, inclined him henceforth to peace. The moral drawn by Guaynerius is that barons and princes should beware of letting their nativities become known to their foes.[69] In the work on diseases of women he shows rather less confidence in the particular portion of astrological theory upon which he happens to touch, pointing out that other reasons than the successive monthly rule of the planets over the foetus can be given for the seven months' child living and that of the eighth month not living.[70] On the other hand, astrological considerations entered into his own treatment of the mad lady of Savoy. He spared her the frequent beatings recommended by Rasis for maniacs, and

[65] *Ibid.*, fols. 23r-25r.
[66] *De peste*, II, ii, 4.
[67] Vatic. 8759, fol. 38r.
[68] *De venenis*, cap. 2.
[69] Vatic. 8759, fols. 8v-9r.
[70] See cap. 30 in Canon. Misc. 29.

seems not to have employed actual cautery on the commissura at the spot where the doctor's middle fingers meet, if he places one palm on the bridge of the patient's nose and the other on the nape of his neck. Some advise that the cautery penetrate to the bone, others that it burn into the bone, and Albucasis that it burn a piece out of the bone about the size of a nut. Instead, Guaynerius used "potential cautery," by which he probably means some acid or caustic water, on a place the size of a ducat. This produced escara which he removed by covering it with butter. Having thus uncovered the cranium, when the moon was approaching conjunction he trepanned the skull even to the dura mater, "for then more than at another time, the brain is distant from the cranium." After the bone was removed the hole remained open for months, and the cure of that noble damsel (*nobilis illa domicella*) who had been a maniac for two years was permanently effected.[71]

It was usual to assign astrological causes for the Black Death, and Guaynerius is no exception to the rule in his pest tractate. The second chapter of its first part was devoted to the manifest and occult influence of the celestial bodies. In it Guaynerius affirmed that anyone learned in the science of astrology could very easily know present or future pest. He did not, however, go into the matter at length because it would take too much time, but promised in another treatise to collect all that had been said on the prognostication of pestilence. Later in the same work, discussing how long a plague-stricken dwelling should be left uninhabited, some authorities saying for forty days and others for six months, Guaynerius advised that it be left untenanted for at least three months, on the ground that such pestilences, coming from a particular aspect of the stars, last at least through one *triplicitas* of the signs of the zodiac.[72]

From Guaynerius's treatises on pest and poisons we are led to think of him as credulous and even superstitious, rather more so perhaps than some other medieval writers on poisons. William

[71] *De egritudinibus capitis*, XV, 8. [72] *De peste*, III, 3.

de Marra, for instance, displayed more medical sense and reasoning power. Against this impression, however, should be noted a passage in another of his works in which he explains why magic ceremonial is employed and tolerated in medical practice. He has just listed such superstitious procedures against epilepsy as whispering the names of the three Magi in the patient's ear, giving him some drops of his own blood, or the gall of a dog killed immediately after his fall. He adds that if the person who first sees the epileptic fall urinates in his own shoe, then shakes it as if he wished to wash it, and finally gives the urine to the patient to drink from the shoe, a complete cure will be wrought. Guaynerius goes on to explain that epilepsy is poisonous in character and needs something with an opposite occult quality to dispel it. He recognizes that this explanation does not account for such attendant ceremony as that above detailed, and remarks that such ritual is to increase the patient's faith in the remedy so that it may do him more good. Thus physicians, he states, prescribe an odd number of pills because the people think odd numbers more perfect than even. Therefore all diseases of a poisonous character are more easily cured by adding strange ceremonies and unusual requirements. So Guaynerius asks indulgence if henceforth in his work he appears to be setting forth old wives' remedies or what seem to the reader incantations and charms. But nothing will be set down without a reason which, if need be, he could explain on natural principles.[73]

He remains true to these principles in his discussion of *incubus* which he treats as a physical phenomenon or sensation of suffocation or oppression caused by vapors arising in the body and like causes, although the vulgar think it a demon suffocating men. Others think that witches do it by enchantment just as they are supposed to be able to assume various forms, "and our common people call them *strigae* or *zobianae*, and say that they often assume the shape of cats."[74] Natural principles, however, will scarcely explain his story that, when the people forbade the

[73] *De egritudinibus capitis*, VII, 4. [74] *Ibid.*, VI, 1.

lepers to use a bath near Acqui, its virtue ceased therewith, until the bishop led a procession and by prayers to God and promising that the bath should henceforth be free to all procured a renewal of its medicinal properties.[75]

In the works of Guaynerius, as in others of the fifteenth century especially in Italy, we can see the current of alchemical thought and activity joining the stream of medical writing and practice. In the pest tractate we find a number of references to *aqua ardens, aqua vitae,* alembics, baths of Mary, distillation, coction, and sublimation.[76] From the *Secret of Secrets* of the Pseudo-Aristotle to Alexander in the chapter on precious stones is quoted an alchemical paragraph opening, "Separate earth from fire because the more subtle is more worthy than the gross."[77]

Guaynerius makes some allusions of a semi-chemical character to gases and salts. Discussing why certain substances seem to sweat in the presence of poison, Guaynerius suggests that the air is thickened by vapors emitted from the poisonous substances and then affects the objects which are employed as safeguards against or as detectors of poison just as the breath dims a mirror or other polished surface. Were the air hot and dry, perhaps the substances would not sweat. Guaynerius strongly urges that such safeguards always be placed at table over the salt which attracts moisture so that the detectors are sure to sweat if the air is infected.[78]

[75] *De balneis Aquae civitatis,* cap. 2; fol. 44r in *De balneis,* 1553.

[76] They occur chiefly in one chapter, however: *De peste,* II, ii, 3.

[77] Since the passage may be of some service in distinguishing the different versions of the *Secret of Secrets* current in the Latin middle ages, I quote it. II, ii, 3: "Sublimationis quoque modos si quis subtiliter inspexerit parabolice tetigit Aristotiles in de secreto secretorum ad Alexandrum capitulo de lapidibus preciosis illo paragrafo, Separa terram ex igne quia subtilius dignius est grosso. Potest enim ex calore ignis temperato sic una res a suo terreo et ab aliis qualitatibus calori naturali indigerendo resistentibus denudari ut sumpta in non perceptibili tempore ab ipso calore naturali deducatur actum quod huic mixtioni in distillando acquiritur infallanter."

See Robert Steele's edition of the *Secretum secretorum,* 1920, p. 116, "Separa terrenun ab igneo, quia subtile dignius est grosso, et rarum spisso."

[78] *De venenis,* cap. 2, "quia sal sua virtuali humiditate iuvat ut aer infectus attingens cornu in rorem convertatur."

Moreover, salt itself is hostile to poison.[79] Guaynerius in the same chapter adverts to the manufacture of artificial gems. He had seen a certain sapphire made of crystal which many artificers deemed genuine and of great price.[80] He speaks of the danger of being poisoned by food kept in metal vases, but thinks that vases of silver or lead treated with tyriac might preserve food stored in them from being poisoned, since he believes that alchemists often employ *napellus* or other poisons to congeal the mercury in making artificial silver, and that vases of such alchemistic metal perhaps injure the food which stands in them, especially if it is hot. He adds, however, that he has said "perhaps" because he has not tested such vases himself.[81]

Guaynerius was inclined to be a little sceptical as to the use of one part of potable gold with three parts of a curative "water" to enhance its virtue, on the ground that gold is already perfect and cannot be altered by fire. Two trustworthy alchemists, however, had assured him that they knew how to make it infallibly, and that without using sal ammoniac or any other corrosive or poisonous substance, so that it flowed like wax with the fifth essence of the water of life.[82] Thus, despite the papal bull against the activities of alchemists a century before, we find them adduced as authorities in works of medicine. And we add further indications from Guaynerius to the evidence of previous chapters that the employment of chemical remedies long antedated Paracelsus and the age of iatrochemistry.

[79] *Idem,* " . . . ita sal sua occulta proprietate quam maximam habet contra venena. . . ."

[80] *Idem,* "Et ego quamdam vidi saphirum ex cristallo factam quam artifices plures mineralem (*minoralem* in ed. of 1481) ac magni pretii iudicaverunt."

[81] *Idem,* "Et dixi forsan quia talia non fui expertus, sed satis est verisimile."

[82] *De peste,* II, ii, 3, "Habui tamen a duobus alchimistis fide dignis quod ipsum indubie facere sciunt sine salis armoniaci seu alterius corrosivi sive venenosi admixtione immo quod cum quinta essentia aque vitis (*sic*) ipsum sicut ceram fluere faciunt, quod si fieri potest cum hac aqua ut supradictum est aurum iungendo potabile nihil dici supra potest."

CHAPTER XLVIII

JOHN DE FUNDIS AND GIORGIO ANSELMI

An earlier chapter dealt with specimens of astrological predictions from 1405 to 1435. We now resume where we left off there, since the first work treated in the present chapter is a prediction for the year 1435. It is preserved as an unbound paper pamphlet in the university library at Bologna, where it was composed on the seventh of February of that year by Iohannes Paulus de Fundis, doctor of arts, lecturer in astronomy and medicine at the university, and astrologer of the commune of Bologna.[1] The name, Iohannes de Fundis, appears in the faculty lists of the university of Bologna for most of the years from 1428 to 1473, usually as lecturer in astrology.[2] In the manuscripts of his other works are found various forms of the name: Iohannes Lauratius de Fundis, and Iohannes Paulus Lauratius de Fundis. But all seem to refer to the same astrologer of Bologna. Although called simply a doctor of arts in his prediction for 1435, John is spoken of as "doctor of arts and medicine" in the colophon of a work composed two years earlier.[3] He also wrote works of astronomy, such as a *New Theory of the Planets* and a *New Sphere*.[4]

[1] BU 2, fols. 1-10r: "Iohannis Pauli de Fundis Tacuinus astronomico-medicus," opening, "Altissimi dei nostri Ihesus Christi virtute chooperante primo in hoc meo iudiciolo. . . ." The colophon reads, "Datum Bonon. die septima febr. 1435 per doctorem artium Iohannem paulum de fundis actu legentem in astronomia et in medicina nostris studentibus et necnon inclite et excelse com(mun)itatis Bonin. astrologum benemeritum."

[2] See *Fundis* in the index of Dallari, *I rotuli* etc., IV (1919), 131, for page references to the various mentions of him.

[3] BM Royal 8.E.VII, 15th century, fols. 73r-77v: "Explicit questio de duratione . . . huius etatis mundi compilata ac edita per me artium et medicine doctorem Iohannem Paulum de Fundis ac etiam in astronomia actu Bononie astrologie monarcham legentem et disputantem. 1433."

[4] Utrecht 724, early 16th century according to the catalogue, but these items seem copied in 1456; the catalogue also errs in calling the author "Lausanus:" fols. 56r-63r, "Nova theorica planetarum magistri Iohannis Laurati medicinarum doctoris experti astronomi de Fundis in Bononia. Theorica speculativa dicitur . . . / . . . per me Iacobum Hayry (?) anno quinquagesimosexto prima die augusti in Bononia;" 63v-68v, "Incipit nova spera materialis magistri Iohannis Lauratii de Fundis artium et medicine doctoris expertissimi astronomi in Bononia. Cum nostra versetur cognitio . . . / . . . Et sic finit tractatus de spera materiali Iohannis Lauratii de Fundis per Iacobum quemlibet (?) anno quinquagesimosexto 10 die augusti in Bononia etc." Venice, S. Marco VIII, 33 (Valentinelli, XI, 106), 15th century, folio, paper, double columns, fols. 29r-33r, an incomplete text, and fols. 49r, col. 1-57v, col. 2, with figures at fols. 58r-60v, the full text of Theorica planetarum, opening, "Theorica speculativa dicitur scientia motuum planetarum in suis circulis . . .;" fols. 34r, col. 1-48v, col. 2, De sphera, opening, "Cum nostra versetur cognitio ut mentio facta est de universo mundi globo . . . / . . . et in figura potest ostendi. Et hic finitur tractatus de spera Iohannis Lauratii de Fundis deo gratias, Amen." Despite this explicit at fol. 48v, Valentinelli's catalogue represents the treatise as terminating at fol. 44. Valentinelli mistook the rubric at fol. 45r, "De circulis et motibus lune," for the title of a new treatise, but the seventh chapter of the *Sphere* of John de Fundis does not begin until fol. 47v, col. 1, "Septimum capitulum de causis." FN Palat. 795, 15th century, fols. 36r-49v, is an Italian translation of the *Theory of the Planets*.

[5] BN 7273, 15th century, paper, double columns, fols. 1-108v: "Altissimus deus eternus qui sua sapientia trinus et unus solem lumine magno decoravit . . . / . . . Finis huius rescripti super tractatum de spera compilati per me (col. 2) Iohannem Paulum de Fundis dum legerem Bononie in astronomia anno domini 1437. . . ."

[6] In the commentary on Sacrobosco this is further illustrated by two figures:

His commentary on the *Sphere* of Sacrobosco is yet a third such work written at the request of his students and of a citizen of Bologna while John lectured there in astronomy in 1437.[5]

John de Fundis's treatises on the sphere and theory of the planets seem brief summaries of the usual medieval doctrine on these matters and of little independent importance. That on the sphere in seven chapters treats of the material sphere, the orbs of the elements and their sphericity, the center of the earth, the rotundity of the earth and its circumference, the sphere of water, the upper regions, the movements of the heavens from east to west, the sphericity of the universe and its various circles, the rising and setting of the signs, the seven climes, the circles and movements of the sun, of the moon, of the head and tail of the dragon, and of Venus and Mercury. A circular figure of the spheres shows only the primum mobile beyond the eighth sphere, but John alludes to persons who add a tenth sphere which Sacrobosco did not mention. John makes the usual statement that the earth's center of gravity and that of magnitude are different, so that one fourth of the earth's surface is above water.[6] Less usual

in his representing the shape of the earth as oval instead of spherical in consequence. He states that the circumference of a circle is three and one seventh times its diameter and explains how the circumference of the earth can be calculated by measuring a degree or a distance such as that from Milan to Paris. By such methods Theodosius, Ambrosius, and others have estimated the circumference of the earth as 252,000 stades.

But to return to the prediction for 1435. By way of introduction John de Fundis blames both sky and princes for "so many earthly tribulations," but he censures the princes more than the heavens, since they are able, if they will, to resist the influence of the stars. As this suggests, John maintains the freedom of the will. After such preliminaries he treats of the effects to be expected from a universal eclipse of the moon which will occur on Saturday, November 5, 1435. He then turns to more particular judgments for the ensuing year which he considers by quarters or the four seasons, spring which comes first extending from March 11 to June 12. The eight chief topics considered for each quarter are the weather, fertility and penury, sickness and pestilence, war and peace, the condition of the populace, merchants, and the like, the state of pope, cardinals, bishops, and other clergy, that of kings and princes, and that of various lands and cities. Thus he follows about the usual model for such annual forecasts.

This prediction for 1435 was not John's first work. In 1433, while lecturing and disputing on astrology at Bologna, he composed a *Question concerning the duration of this age of the world,* in which he argued whether through the perpetual character of the movements of the fixed stars and planets the duration of the present age of the world would be perpetual.[7] In 1445 he made a revision and enlargement of the work at the request of

BN 7273, fols. 5v, 11v. At fol. 6r-v it is stated that Aristotle mentioned only eight spheres but that some add a tenth. Later in the work the existence of a ninth sphere is frequently assumed.

[7] BM Royal 8.E.VII, 15th century, fols. 73r-77v: "Questio de duratione huius etatis mundi est talis. . . ." For the colophon see note 3.

Zaccaria of Treviso, orator at Bologna for the Venetian senate.[8] This contains allusions to other forms of divination than astrology. John tells how Robert of Naples used to send men about at carnival time to see what the people were doing in order to predict the events of the coming year therefrom as well as from the disposition of the stars. Hints as to the future may also be gleaned from the games played by boys. Demented persons and certain others in their dreams are especially sensitive to impressions from the stars of future import.[9]

In 1451 John de Fundis composed at Bologna a defense of astrology against Nicolas Oresme which shows that the latter's attack was still remembered, if not accepted.[10] John admits that Oresme was "skilled in natural science and expert in the specu-

[8] BN 10271, 1481 A.D., fols. 204r-227v: rubric, "Questio de fine seu durabilitate mundi per egregium artium et medicine doctorem Iohannem Paulum Lauratium de Fundis et in astronomia expertum"; incipit, "Quamquam alias infrascriptam questionem de fine sive duratione mundi reformaveram ut que sub obscuris vocabulis complexa fuerant in claram sententiam patefierent, nunc iterum quoniam in ea etiam multa contexta sunt que propter eorum subtilitatem indigent ut in sermonem clariorem extendantur, decrevi ad preces prestantissimi preclarissimique artium et iuris utriusque doctoris domini Zaccarie Trivisani Veneti patritii ad presens magnifici oratoris Bononie pro serenissimo senatu Veneto dictam questionem in ampliorem formam reducere"; colophon, "Explicit questio de duratione seu fine mundi olim compilata et nuper rectificata per artium et medicine doctorem Iohannem Paulum Lauratium de Fundis Bononie commorantem anno a nativitate domini 1445, que a mendoso exemplo extracta et raptiva (?) scripta fuit Neapoli anno a nativitate eiusdem domini nostri Ihesu Christi 1481 septimo kalendas Ianuarii per me Arnaldum de Bruxella."

This example of Arnold's work is noted neither by M. Fava e G. Bresciano, *La stampa a Napoli nel XV secolo,* I (1911), cap. 4, II (1912), 67-87; nor by L. Delisle, "L'imprimeur napolitain Arnaud de Bruxelles," *Bibliothèque de l'école des chartes,* 58 (1897), 741-743, who limits his account to BN 10264. Our MS also supplies a new date in Arnold's career.

[9] BN 10271, fols. 211v, 213r.

[10] BN 10271, fols. 63r-153v, rubric, "Tractatus reprobationis eorum que scripsit Nicolaus orrem in suo libello intitulato de proportionalitate motuum celestium contra astrologos et sacram astrorum scientiam, compilatus per Iohannem Lauratium de Fundis." Incipit, "Pro suo exordio aggreditur dictus Orrem. . . ." Colophon, "Explicit tractatus de reprobatione eorum que scripsit Nicolaus Orrem ut supra, necnon de reprobatione eorum ab aliis multis obiecta sunt contra astrologos et sacram astrorum scientiam, subiuncto quoque in hac doctrina modo et ordine iudicandi tam in nativitatibus quam in revolutionibus annorum compilatus per artium et medicine doctorem Iohannem Lauratium de Fundis Bononie commorantem Anno domini 1451 die 30 octobris."

lative sciences of calculation and further subtle in the matter of proportions," only to marvel that he should have "committed so great an error" as seems involved in his attack on astrology.[11] Against Oresme's position in his treatise on the proportionality of the movements of the heavenly bodies[12] that their regular recurrence could not be surely assumed, especially if carried to the length of the hypothesis of a *magnus annus,* after the lapse of which the stars would resume exactly their previous positions, John maintains that such regular recurrence is possible.[13] On the other hand, he holds that Oresme was deceived by his assumption of simplicity of motion of the heavenly bodies into holding that conjunctions of the planets could occur in but a few places where they would be repeated over and over.[14]

John de Fundis does not limit his defense of astrology to Oresme's arguments but answers the objections of other opponents of the art.[15] Among these are Raymond Lull[16]—whose opposition to astrology was of course only partial—certain preaching friars, an anonymous author,[17] and the older patristic writers such as Augustine, John Damascenus, and Ambrose.[18] Henry of Hesse does not seem to be mentioned. In his third chapter John sets forth "the common principles, canons, and rules" for particular astrological judgments whether of nativities or of revolutions.[19]

John de Fundis further evidenced his interest in occult arts in the introduction to his commentary on the *Sphere* of Sacrobosco, where he treats of astronomy, astrology, and various kinds of divination or 'mancies.[20]

[11] BN 10271, fol. 63v, "Mirandum est profecto de hoc auctore quod cum fuerit vir peritus in naturalibus et in scientiis speculativis calculatoribus expertus et etiam subtilis in proportionibus quod tantum errorem commisisse visus est."

[12] The allusion is presumably to Oresme's *De commensurabilitate* (or, *incommensurabilitate*) *motuum celestium.*

[13] BN 10271, fol. 64r.

[14] *Ibid.,* fol. 68v.

[15] To them is devoted his second chapter, BN 10271, fol. 75r, rubric, "Capl'm 2m de hiis que apud alios plures calumniose contra astrologos obiecta sunt."

[16] *Ibid.,* fol. 75v, "Et primo ad ea que scripsit Raymundus Lullus in suo libro de astronomia."

[17] *Ibid.,* fol. 86v, "auctor sine nomine."

[18] *Ibid.,* fol. 97r *et seq.*

[19] *Ibid.,* fol. 103r, "in quo positurus sum communia principia canones et regulas quibus devenitur ad particularia tam in iudiciis nativitatum quam revolutionum annorum mundi."

Another feature of the commentary on Sacrobosco is, as in other treatises of the time, the propounding and discussion of various questions or *dubia*: whether life is possible at the equator, whether there are two winters and two summers there, whether the polar regions are inhabited, whether the celestial spheres are continuous or contiguous, concentric or eccentric; whether the sky is moved, and if so, whether by a single mover; whether the heavenly bodies are colored; whether, if their motion ceased, there would be any movement among inferiors; whether the superior bodies produce life and heat in inferiors; whether sun or moon or a sign of the zodiac exerts as great influence upon inferiors when rising or setting as when in mid-sky; whether the black skins of Ethiopians are caused by the heat of the sun or their inborn nature; whether eccentrics and epicycles must be posited to save the phenomena, and many other questions. In discussing them, John has a rather peculiar scholastic method. After presenting various arguments to the contrary, he often says, "But since the affirmative is true," before he advances any reasons to prove it so. He states that negroes who migrate to cold climes often have white offspring.[21]

Some authors subsequent to Sacrobosco are cited like Andalò di Negro and Albert of Saxony.[22] John also had made personal astronomical observations. In 1433 about the end of April he saw Mars in Sagittarius for many successive nights at the third hour. In May, instead of advancing into Capricorn, it retroceded to Scorpion and at the close of June was distant only ten degrees from Scorpion whereas in April it had been much further from it.[23]

From the specimen *dubia* which we have listed it is evident that John's commentary is as much astrological as astronomical.

[20] BN 7273, fols. 1r-108v. See notes 5 and 6 above (at pp. 233-234) for its incipit, explicit, and further details.

[21] BN 7273, fol. 85r, col. 1.

[22] BN 7273, fols. 32r, 34v, col. 2.

[23] BN 7273, fol. 101v, col. 1.

Other specific illustrations may be given. Those who posit an immobile tenth sphere, ascribe differences in language and nationality to it so that the portion facing Italy produces speech and manners such as the Germans and Spaniards do not have, and vice versa. "They also say that the influence of a part of that sphere is the cause why the ocean leaves a portion of the earth uncovered, but this with all due respect to them is untrue, as I shall show."[24] The days of the week do not immediately follow the order of the planetary spheres. But if one begins with Monday and takes every other day in turn, one obtains the planetary sequence: moon day, mercredi, vendredi, Sunday, mardi, jeudi (Jupiter day), and Saturday (Saturn day).[25] The last named planet inclines men to sodomy and makes them prefer old women to young maidens.[26] Gems from tropical regions have greater virtues, and astronomical images made under the equinox are more potent.[27] Such common astrological doctrines as the successive rule of the planets over the formation of the foetus, the division of the years of human life among them, their conjunctions, and the relation of the parts of the human body to the signs of the zodiac, are also set forth.[28] According to John de Fundis, astrologers employ the natural unequal hours in their judgments, and necromancers should observe the same in their magical experiments, for success in which a thorough grounding in astronomy is absolutely indispensable.[29] He warns astrologers against predicting to the people eclipses which will not be plainly visible, since the vulgar crowd are detractors of astrologers as oldwives are of physicians.[30] Like other commentators on the *Sphere,* John accepts the darkness at the time of the Passion as miraculous but thinks that the miracle consisted in sudden loss of its own light by the sun rather than an extraordinary interposition of the moon, since this would not produce total darkness.[31]

[24] BN 7273, fol. 6v.
[25] BN 7273, fol. 13v.
[26] BN 7273, fol. 17v.
[27] BN 7273, fol. 62r, col. 1.
[28] BN 7273, fols. 20-21, 65v, col. 2.
[29] BN 7273, fol. 77r, col. 2.
[30] BN 7273, fol. 106r, col. 2.
[31] BN 7273, fol. 107r.

There is also some geographical discussion. Since three-quarters of our globe is under water, John believes that the Antipodes are uninhabited. The ocean surrounds the whole habitable quarter and washes Spain, Flanders, England, Holland, Scotland, and many other places. Our Mediterranean sea flows in from west to east through the Straits of Gibraltar, but the Indian Mediterranean Sea in the southwest and the Red Sea to the southeast come from the south towards the north. These seas are connected only by the ocean. "And if you wish to understand this better, look at a map of the world (*mappam mundi*)."[32] All of England lies outside the seven climes, not that it is unsuited to human habitation but because it was not yet settled when the division into climes was made.[33] John holds that the climes and the earth as a whole move and change their situation in comparison to an imaginary fixed point in the firmament. The constant displacement of heavy bodies on the earth's surface disturbs its equilibrium, and the erosion effected by great rivers produces changes. Moreover, the land in the west tends to disappear beneath the sea, while new land emerges from the ocean in the east. So although immobile so far as perceptible movement is concerned, the earth as a whole moves in a circle imperceptibly and insensibly, making a complete giration in perhaps a hundred thousand years.[34]

The spots on the moon may be produced by variation in density, or by the fact that it alone of the celestial bodies shares to some extent in terrestrial nature, or by the reflection from the water which covers most of the earth's surface. But John rejects the last explanation on the ground that such a reflection would keep changing. The people of Italy believe that Adam and Eve were stellified in the moon, while English rustics think that a peasant who had stolen thorns was lodged there with the bundle of thorns still on his back. John prefers the Italian legend as more "consonant with truth."[35] Another interesting passage is

[32] BN 7273, fol. 80r, col. 2.
[33] BN 7273, fol. 91r, col. 1.
[34] BN 7273, fols. 94v, col. 1-95r, col. 1.
[35] BN 7273, fols. 100v-101r.

that in which he warns against looking at the sun during an eclipse with the naked eye. One should use a mirror or a vase full of water or a long perforated tube or a *Gerbertana*—which would seem to be some sort of optical instrument named after the famous Gerbert. Or a thin black cloth may be placed before the eyes or the reflection of the eclipse may be observed in a basin of water.[36]

Following John's commentary on the *Sphere* is a work on judicial astrology without name of author.[37] Since it is the only other treatise in the manuscript it may with some probability be regarded as also by John Paul de Fundis, especially since it seems to end unfinished after only eleven lines of chapter 13 of *Particula* IV, so that there is no opportunity for an explicit or colophon in which the author's name may have occurred. After a brief introductory *Particula* of only three chapters comes a much longer second *Particula* concerning accidents which befall in matters of the faith and the Roman church and its heads and other religious persons.[38] The influence of conjunctions of Saturn and Jupiter, of Saturn and Mars, of revolutions of the year, and of the planets in relation to one another are considered with this in view in as many successive chapters. The fifth and last chapter of this section is devoted especially to the destiny of the members of religious orders.[39] The third *Particula,*[40] in eighteen chapters, turns to secular personages such as kings, barons and magnates. The fourth *Particula*[41] further considers the fate of kings according to the revolution of the year of their enthronement or reception of power. In its seventh and eighth chapters we return to the matter of conjunctions. The tenth and eleventh chapters treat of the advent of prophets.

[36] BN 7273, fol. 106v.

[37] BN 7273, fols. 109r-163v, col. 1, opening, "Postquam novisti introductorium ad astrorum iudicia. . . ." The writing is neater and more legible than that of John's commentary on the *Sphere* which precedes it.

[38] *Ibid.*, fol. 113v, col. 2, "Incipit particula 2a de accidentibus que in fide et ecclesia romana et eius capitibus et in aliis religiosis accidunt particulariter pertractando."

[39] *Ibid.*, fol. 121v, col. 2.

[40] Its first chapter seems to be omitted, most of fol. 122v being left blank.

[41] It begins at fol. 148r, col. 2.

In opening the second *Particula* on ecclesiastical things and persons, the author admits that these should not be a subject of astrological inquiry because they remain in the hands of the Creator. Nevertheless because so many persons are desirous of astrological information on this score, he speaks specifically on it so far as his weak intellect suffices.[42] On the next page he warns again that the rules of the astrologers "do not hold for our faith," and that, if he writes anything not consonant with our faith, it is not to be believed. He believes firmly that Christ came by divine providence of the eternal Father and not at the dictation of any conjunction such as marks the advent of other prophets in other sects. "But if you will not rest content with this but wish to judge concerning our faith, you will calculate the great conjunction which preceded the advent of Christ." The ninth house is that of great religions, the third that of lesser sects.[43] A certain master, "who perhaps would be called heretical in this," had placed Christianity under a conjunction in this third house.[44] Despite his aforesaid restrictions the author himself later speaks out boldly:

> And I say that if the sun is fortunate there, and the lord of the ninth house is fortunate through aspect of the fortunate ones to it, and is removed from unfortunate fixed stars and aspects of the unfortunate planets, it signifies that pastors of the church will stand well and have their exaltation and chastity, and their subordinates will humble themselves to them and obey them, and their virtue will increase and their nobilities, and men will love the mandates of the Faith.[45]

The author also dabbles in astrological necromancy and magic, and, as has been noted in an earlier chapter, appears to derive most of what he says on such themes from Antonius de Monte Ulmi. In connection with the theory that a nigromancer or great experimenter should be born under a constellation which will endow him with the essential capacity, and that everyone cannot hope to succeed with such experiments, he states his belief

[42] BN 7273, fol. 113v, col. 2.

[43] *Ibid.*, fol. 114r, col. 1.

[44] BN 7273, fol. 116v, col. 2.

[45] BN 7273, fol. 118v, col. 2.

that Virgil owed his magic power and reputation to such inborn qualities and not to possession of greater knowledge than others. He also is of the opinion that teachers of grammar because of Virgil's poetry ascribe many feats to him which are not true and praise him as an excellent astrologer, although there is not an authentic word extant by him on the subject.[46]

Just before the text breaks off, the author is telling, in connection with the influence of conjunctions on the rise of new sects, what sort of animals the prophet and his followers will ride. If Saturn dominates, they will ride mules; if Jupiter, elephants; if Mars, *ronzerci* (?); if the sun, horses; if Venus, camels; if Mercury, asses; and if the moon, oxen and cows.[47] This is presumably repeated from some Arabic astrologer. If the chapters which we have just analyzed were not the work of John Paul de Fundis, they might well have been composed by the author to whom we next turn our attention, Giorgio Anselmi.

When Henry Cornelius Agrippa in 1510 submitted a first draft of his *Occult Philosophy* to the abbot Trithemius, in an accompanying letter[48] he expressed his indignation that no one had yet arisen to vindicate so sublime and sacred a discipline as magic from the charge of impiety and to expound it purely and sincerely. All the more recent writers whose works he has seen—Roger Bacon, Robert of England, Peter of Abano, Albertus Magnus, Arnald of Villanova, Anselm of Parma, Picatrix of Spain, Cecco d'Ascoli of Florence, and many others of obscure name—when they promise to treat of magic, have offered nothing but ravings without reason and superstitions unworthy of men

[46] BN 7273, fol. 139v, col. 1: "Et sic per scientiam magice artis non est mirandum de Virgilio sed ipse taliter fuit dispositus quia sine dubio aliquis inventus est cum maiori scientia quam ipse et etiam isti pedagoci (*sic*) gramatice imposuerunt propter poesim eius multa mendacia et faculatoria que non sunt vera et sibi imponitur plus de factis quam ipsemet audiverit in verbis et etiam ipsi fatui pedagoci laudant ipsum pro excellentiori astrologo in antiquis nec verbum auctenticum ab eo inventum, nec demonstratur aliqua invenitur ponit enim aliqua primordia in astrologia per astrorum antiquorum pedes calcentis valens fuit et famosus sed non sic ut ipsi dicunt. . . ."

[47] BN 7273, fol. 162v, col. 3.

[48] *Epistolae,* I, 23: see also Aug. Prost, *Corneille Agrippa, sa vie et ses oeuvres,* I (1881), 195.

of integrity. If Giorgio Anselmi was thought worthy to rank in scientific distinction with the greater names here enumerated, the remnants of his writing which we have been able to examine present little to justify such association, while they largely substantiate the charge of superstition brought against him. Judged by these remnants we should class him with Picatrix and Cecco rather than with Roger Bacon, Peter of Abano, and Albertus Magnus. But they may not do justice to his positive medicine and science.

Giorgio Anselmi, or Georgius de Anselmis, or George Anselm of Parma, was both the son and grandson of medical men, Bernard and Henry, as well as a physician himself. Henry, his father, died in 1386. Giorgio figures in a legal paper of Sept. 17, 1423, and in 1440 was named one of the reformers of the statutes of the college of physicians at Parma. He had four sons. A grandson celebrated him in epigrams, while Burtius ranked him as one of Parma's most learned citizens in times past, who had shone in the fields of philosophy, the liberal arts, and medicine.[49] He also wrote on music, his dialogues concerning harmony being frequently cited in the subsequent works on music of Franchino Gaffuri.[50]

Those works by Anselmi of which I have found manuscripts[51] are devoted to magic and astrology, and perhaps form sections of a more comprehensive work.[52] In the *Opus de magia disciplina* in five tractates[53] Anselmi recognizes that magic is the prohibited

[49] I. Affò, *Memorie degli scrittori e letterati Parmigiani,* II (1789), 153-161. Burtius (or, Niccolò Burci), *Bononia illustrata,* Bologna, 1494, page preceding the signature, b 1.

[50] *Theorica musicae,* Milan, 1492; *Practica,* Milan, 1496; *De harmonia musicorum instrumentorum,* Milan, 1518, cap. 39.

[51] Affò lists half a dozen titles in the fields of music, medicine, astronomy and astrology but cites MSS for only two of these.

[52] They are somewhat similarly addressed to a "vir inclite" and an "inclite miles," while the opening words of the work on magic allude to a preceding discussion of astrology: "Postquam in eis que premissa sunt, inclite miles, suficienter visum est nobis exposuisse motus eos qui hoc in inferiori orbe generabilium et corruptibilium sint consequi motus corporum superiorum. . . ."

[53] FL Plut. 45, cod. 35, fols. 1r-231v: "Georgii Parmensis divinum opus de magia disciplina." For the incipit see the preceding note. The work proper closes at fol. 228v, ". . . rursus autem

variety of philosophy but holds that it none the less forms a permissible object of investigation, just as it is proper for a theologian to discuss sin or for a physician to write on poisons. Giorgio further lauds the search into occult causes and points out that in ancient Persia the word *magus* was equivalent to *sacerdos* or priest in Greek. After such hints of a favorable inclination towards magic he even declares that a philosopher may be a *magus* with propriety, if he employs his knowledge of magic for good ends only. Anselmi hastens to add, however, that he wishes in this opinion to submit to the Roman church. In the next chapter are enumerated various parts of magic or divining and superstitious arts. Here Anselmi seems indebted to his fellowtownsman of the previous century, Thadeus of Parma, some of whose peculiar appellations for subdivisions of magic he duplicates or parallels: for example, major and minor theurgy, salisaltica (salisaliptitas), altigraphia for which both name Firmicus Maternus as inventor, polismancy, agathomantia, alphitica (aliptica), scenobatica, and haustus. There are, however, divergences between Giorgio and Thadeus in the explanation, arrangement, and subordination to one another of these terms. For instance, for Thadeus gyromancy was concerned with phenomena in the sky such as comets and falling stars, while Giorgio includes comets under pyromancy and describes gyromancy as divination from animals.

Anselmi does not proceed to discuss all these varieties of magic in detail but explains that most of them have fallen into disuse. Among the reasons given for this decay are the opposition of the priests to most such arts and the declining interest of kings

servent modos et cavillos plures quos medici scripserunt diligenter etc. Finis laus deo op. max." Recipes for images and an "Oratio" follow on fols. 229r-231v.

This MS was not noted by Affò, but another listed by him turns out to be a section of the same work: Vatican 5333, 16th century, 38 fols. "Quarta pars quarti tractatus Georgii Parmensis de modis specialibus imaginum octavi orbis et de modis compositionum earundem per exempla . . . / . . . Dicat artifex mulier quecumque super hac imagine transierit eat redeat frequens sepelitur in loco transitus. Explicit tractatus quartus de imaginibus magistri Georgii Parmensis 1542 die februarii ad dei laudem et honorem. Explicit."

and public in learning of any sort apart from gain. Anselmi's subsequent discussion therefore confines itself to a few matters such as geomancy, astrological images, and poisons. The fifth and final tractate on this last theme is quite brief,[54] giving recipes for deadly poisons with an accompanying adjuration to the devil, and a still shorter second chapter on modes of defense against them.[55]

The character of the longer fourth tractate on images may be illustrated by specimens from its fourth part on images of the eighth sphere. The first chapter treats of images for the signs of the zodiac which are efficacious in each case especially for whatever is under the government of the sign in question. That for Aries, for example, comforts the head, preserves one from eye and skin diseases, benefits kings, lords, nobles, and military commanders, and is of use in mines. Anselmi further specifies of what materials each image is to be made and what positions of the stars are to be observed in its fabrication. Chapter two deals similarly with nineteen images for the eighth sphere to the north of the zodiac, and chapter three with thirteen to the south of it. Then the last chapter treats of images which are not stellar but "concomitant to the twelve signs." Words for the artifex or operator to utter are now specified. These images of the fourth chapter insure houses from thieves or fire, expel serpents, stir up demons, open closed doors, keep off dogs, multiply sheep and goats, or, buried underground, exert various compelling influences upon men or animals who pass or try to pass over them.

Affò distinguished two works of Anselmi called *Theoremata radicalia,* one on medicine in four books, the other on astrology with the alternative title, *Astronomia.* Only the latter is known to me.[56] It is a collection, somewhat on the order of the *Centi-*

[54] But perhaps is incomplete since it is headed (FL Plut. 45, cod. 35, fol. 224r) "Tractatus quintus et ultimus huius artis de modis Alphetice. Pars Prima de Veneficiis," and so might be expected to go on with the other divisions of Alphetica: namely, maleficium, praestigium, fascination, and haustus.

[55] *Ibid.,* fol. 228v, "De modis se defendendi a venenis capitulum secundum."

[56] Vatican 4080, fols. 41r-53r: "Georgius Anselmus salutem et recommendationem. Cum pluries apud te, vir inclite, pluribus de rebus . . . / . . . con-

loquium ascribed to Ptolemy, of brief astrological maxims, rules, or generalizations with a paragraph of expository text for each. The theorems are basic commonplace of astrology rather than new doctrine. Each planet is the subject of a particular apothegm. Two theorems, the seventh and eighth, exceed the strict limits of astrology and treat of demons who are said to be moved by appetite as well as to follow the movement of the heavens, and of images, fascination, and haustus.[57] These are all credited with vast powers. Our manuscript ends with the forty-third theorem but appears to be incomplete.[58]

stiterit vitam pariter et corpus et animam domini radicis eius sive natalitii vel cuiusvis alterius initii custodit. . . ." The text then appears to break off unfinished. In the top margin of fol. 41r is written, "Incipit astronomia magistri Georgii de Anselmis," but in the letter of dedication we read, "fuit vero cartule prime inscriptus hic titulus theoremata radicalia. Vale."

[57] For Anselmi haustus is not a magic potion but a binding or hypnotizing of men by enchantment and imprecations: see FL Plut. 45, cod. 35, fol. 8v, "Haustus est maior quam fascinatio; est vero cum per incantus aut orationes vel imprecationes ligatur homo ut nihil penitus curet et quasi insensatus sit et stupidus et amens et per singulos dies deficere videatur exaustus eius omnibus viribus anime et corporis."

[58] See Appendix 48 for a list of the headings in Latin.

CHAPTER XLIX

NICHOLAS OF HUNGARY AND NICCOLÒ DE COMITIBUS

Over two centuries ago Quetif and Echard printed the prologue to the first book of the *Liber anaglypharum* of Nicolaus de Dacia, or Nicholas of Hungary.[1] His name had been omitted by previous historians and recorders of the Dominican order to which he belonged, but as Quetif and Echard stated, he was a person of note in the fifteenth century, master of sacred theology, and a philosopher especially learned in astronomy. According to the titulus of a manuscript then in the royal library of Paris, the work, or at least the prologue to its first book, was written in 1456 in the Dominican convent of a small place (*in villa Mariologii*) which Quetif and Echard were unable to identify. Simon de Phares also listed the work, which he called *Liber anagliffarum astronomie,* as of the year 1456.[2]

Nicholas opens the prologue with allusion to the once flourishing state of astronomical and astrological studies and the want of modern diligence in mathematics. This defect appears to have caused offense, and many "have utterly abandoned the wisdom of this infallible truth." He further suggests that the subject has suffered from being confused in men's minds with astrological necromancy, or at least with nigromancy that makes a pretense of astrology, as the venerable Albertus Magnus pointed out in his work entitled *Speculum.*[3] Nicholas has accordingly, at the instance of certain venerable persons, sought to revive waning astrological science by a compendious compilation from the more useful works of astronomy and astrology, which, as

[1] J. Quetif and J. Echard, *Scriptores ordinis praedicatorum recensiti notisque historicis et criticis illustrati,* Paris, 1719, I, 826-827. For MSS of the work see Appendix 49.

[2] *Recueil* (1929), p. 259.

[3] "Ille venerabilis Albertus magnus in libro suo qui speculum intitulatur." The allusion is the *Speculum astronomiae,* concerning which see *Magic and Experimental Science,* vol. II, chap. 62.

Albert said, in no way derogate from the orthodox faith. It has been Nicholas's aim to avoid the prolixity of the diffuse treatments in ancient manuscripts. The full title of his work is *Congeries of Anaglyphs of the Astronomical Faculty*.[4] Its first book will treat of the movements of the celestial bodies; the second, of their general influences upon inferiors; the third, of astrological medicine.

In the fourth and last, it may be in preposterous order, we desire to include some delightful and pleasing dimensions of geometry and admirable arithmetical proportions without which astronomical proportion is deemed sterile.

Quetif and Echard gave further indication of the contents of the first and second books only. The first book subdivided into three *Differentiae,* consisting respectively of five chapters on the movement of the three higher spheres, eight chapters on the movement of the seven planets and eclipses of the moon, and five chapters on *cosmometria,* the geometry or mensuration of the universe. The second book contained seven *Summae.* The first, of seventeen chapters, dealt with the science introductory to mastery of the judgments of the stars. The second, in eight chapters, treated of one hundred and twenty conjunctions of the planets. The third, on revolutions of the years of the world, comprised five *Differentiae,* each of several chapters.[5] But of the other four *Summae* of the second book and of the detailed contents of the third and fourth books we get no account in the work of Quetif and Echard, whether because the manuscript that they were following failed to give it, or because they or some

[4] "Cuius titulum Congeriem anaglypharum astronomicae facultatis libuit nuncupari." Nicholas would seem to have employed this word (an early instance of the humanistic insertion of Greek words in titles) in the sense of a reduced copy or image rather than its proper meaning, low relief.

[5] These may perhaps be most satisfactorily indicated in the Latin:
Diff. I, de scientia cognoscendi generaliter accidentia contingentia vulgo (4 caps.)
Diff. II, de significatione planetarum (3 caps.)
Diff. III, de speciali planetarum operatione in revolutione anni (8 caps.)
Diff. IV, de scientia durabilitatis regnantis (5 caps.)
Diff. V, de descriptione orbis universi et convenientia planetarum et signorum ad ipsum (4 caps.)

ecclesiastical superior thought that they had sufficiently disclosed the astrological character of their fellow-Dominican's work.

Quetif and Echard did, however, indicate the existence of another manuscript at Paris containing the text, although imperfectly in either case, of the second and third books of Nicholas's work, and this is still available. In a manuscript of the British Museum written in 1476 there appears to be the full text of the third book, and manuscripts at the university of Cracow seem to give the fourth as well as the second and third books. And although Quetif and Echard indicated the nature of the contents of only three of the seven *Summae* of the second book, a manuscript at Munich contains the fifth *Summa* dealing with nativities.

Since Nicholas has done little but excerpt and digest the works of previous writers, we shall touch on his content only enough to demonstrate the completeness of his support of astrological doctrine in all its ramifications, whether conjunctions, revolutions, nativities, elections, or the use of astrological images. The last he follows Albertus Magnus in regarding as the sublimity of astronomy, and he adds that it is the natural magic of which Thebit and Ptolemy have treated,[6] referring to the books of images ascribed to them. Among the numerous astrological diagrams and horoscopes with which Nicholas fills his work is one for the nativity of our lord Jesus Christ which he ascribes to Albertus Magnus,[7] and another to illustrate the great conjunction of Saturn and Jupiter which announced the deluge.[8] He affirms that "all astronomers are agreed in this, that there never was any conjunction of those two planets without a great change in this world." He gives a long list of such conjunctions from the beginning of the world with the historical events with which they are to be related, ending with ten small conjunctions, part past and part future, for the years 1404, 1423, 1443, 1463 (when there will be great mortality), 1483, 1503, 1523, 1543,

[6] BN 7336, fol. 1r.

[7] BN 7336, fol. 11v.

[8] BN 7336, fol. 14v, col. 1. The explanatory text at fol. 14r, col. 2, states, "Anno mundi 2105 completo, diebus 210, horis 10, minutis 5, hoc est ante Christum 3223 anni cum 32 diebus, 13 horis, 55 minutis, . . . Sub hac quoque coniunctione factum est diluvium post 121 annos et 79 dies fere ab ipsa."

1553, and 1562.[9] Then, the astrologers say, there will rise a new prophet who will alter the state of the world and will perhaps be antichrist. Of this last conjunction the effect will appear before 1600 A.D.[10] Nicholas does not hesitate to include passages from such an astrological writer as Guido Bonatti[11] who had had trouble over astrology with one of the Dominicans of his day.[12]

Nicholas declares that the Arabs and Chaldeans thought "the science of nativities" the outstanding part of astrological speculation, but that many have turned against it because of the importunity of its detractors "in our time."[13] Nicholas holds that it deserves no such ill fate and treatment and that it is not contrary to free will. In his fifth *Summa* on nativities he treats of such matters as: "Of the inclination of the mind from its aptitude or ineptitude;"[14] "How to tell the honors and offices to which the child may attain?"[15] "Of knowing the marriage of the person concerned and the time and number of his sons;"[16] "Of the prosperity of his peregrinations."[17]

A Nicolaus Comes or Niccolò de Comitibus of Padua, who is described as a count and knight, wrote for his son, named Marmaria or Marmeria or Naymerius, a work in eight chapters on weather prediction and other general astrological judgments, of which there is a fifteenth century manuscript at the Bodleian Library, Oxford, and a manuscript, copied at Padua in 1544, at Venice, in the library of St. Mark's. He describes his son as trained from early years in the noble science of astronomy and as delighting especially in making astrological judgments of daily happenings. The treatise was apparently written in the year 1466.[18] Probably our Nicholas was not the same as Nicolò

[9] *Ibid.*, fol. 16r.
[10] *Ibid.*, fol. 16r.
[11] *Ibid.*, fol. 335v, col. 1, "Judicia 6 domus secundum Gui Bonactum utrum liberatur infirmus ab egritudine an non."
[12] For the incident see *Magic and Experimental Science*, II, 831-832.
[13] CLM 221, fol. 229r, col. 1.
[14] *Ibid.*, fol. 232r, col. 2.
[15] *Ibid.*, fol. 232v, col. 2.
[16] *Ibid.*, fol. 234v, col. 2.
[17] *Ibid.*, fol. 235r, col. 1.
[18] Valentinelli in his catalogue of the manuscripts of St. Mark's so dates it, and at fols. 41v-42r of S. Marco VIII, 78 (Valentinelli, XI, 70), a table of the mansions of the moon is verified to

Conti, the traveler in the east in the fifteenth century, whose adventures were recorded by Poggio.[19] But he is presumably identical with the Nicolaus Comes of Padua whose treatise on the triple movement of the eighth sphere is contained in manuscripts of the Vatican and Laurentian Libraries and with the Nicolaus de Comitibus whom Regiomontanus praised in his oration at Padua.[20]

This second treatise was apparently an earlier composition and addressed to Malatesta de Malatestis in 1450. Noting that the eighth sphere has three motions, one diurnal and uniform from east to west, the second motion of remission obliquely from west to east, and the third of access and recess or trepidation, Nicholas ascribes that last motion to the eighth sphere's own moving intelligence. But for its other two movements two outer spheres are required: a ninth sphere to give it the second motion mentioned, and the *primum mobile,* which thus becomes a tenth sphere, to produce the diurnal revolution. This explanation requires that the fixed stars change their latitudes from the ecliptic of the *primum mobile* which is contrary to the position of Ptolemy, but if one accepts the movement of trepidation, of which Ptolemy was ignorant, variation of latitudes follows necessarily. Moreover, from an astrological standpoint Nicholas welcomes this variation in latitudes of the stars as making more explicable the varying scheme of inferior things under their influences. In this connection he cites the doctrine of Peter of Abano. A little before he had alluded to the contemporary astronomical tables of Giovanni Bianchini whom he called "that most erudite mathematician." It would seem that Nicolaus was

1466. The latest earthquakes and comets mentioned are those of 1456-1457 (*ibid.*, fol. 79r).
[19] *The Travels of Nicolò Conti in the East in the Early Part of the Fifteenth Century,* translated from the original of Poggio Bracciolini, ed. by R. H. Major, London, 1857. Vinc. Bellemo, *La cosmografia e le scoperte geografiche nel secolo XV e i viaggi de Nicolò de' Conti,* 1908. W. Sensburg, "Poggio Bracciolini und Nicolò de Conti in ihrer Bedeutung für die Geographie des Renaissance-Zeitalters," in *Mitteil, d. k. k. geog. Ges.,* Wien, XLIX (1909), 267 *et seq.*
[20] *Corpus reformatorum,* ed. C. G. Bretschneider, XI (1843), col. 542.

not called Comes simply because he was a count but that de Comitibus was his family name. There is a recipe for breaking the stone of a count Nicolaus, but he is probably a different person.[21] There is also the *Mirror of Alchemy,* ascribed to Nicolaus Comes, which seems to date from the fourteenth century and has been treated in a previous chapter.

It was at the urging of his son and others that Niccolò compiled the opinions of the ancients and "of the wise men of our time" concerning the disposition and alteration of the air and the vapors elevated therein. He remarks that the honor of the astrologer is more concerned in this type of prediction than any other, since it is quickly evident to all whether he has judged correctly or not. Nicholas thinks that he has succeeded in setting forth the subject more clearly than have previous writers upon rains and other atmospheric changes. He first devotes a number of pages to preliminary astrological considerations, including an account of conjunctions in the different *triplicitates* and a description of the sixteen winds.[22] After six chapters on the astrological technique of weather prediction, followed by some notable experiences of his own,[23] he takes up in the seventh chapter the more apparent signs by which unskilled persons may foresee weather changes—such signs as comets, other manifestations in the air, and the actions of certain animals. This seventh

[21] Vienna 4751, 15th century, fol. 254r: "Ad frangendum lapidem comitis Nicolai. Recipe flores nucum gallicorum et fac pulverem. . . ." The recipe follows or is added to the *Medical Experiments* ascribed to Galen.

[22] S. Marco VIII, 78, fol. 11v, "De ventis et complexione ac ordine et situ eorum necnon de eorum nominibus." At fol. 15v is given a circular figure showing the winds, ecliptic, equator, tropics, and polar circles. See Appendices 50 and 51 for MSS of works of Niccolò and the headings of his treatise on weather prediction. Although this work appears not to have been printed, it is cited by Camillus Leonardus, *Speculum lapidum,* Venice, 1502; Paris, 1610; II, ii: "et maxime a celeberrimo viro deauratae militiae domino Nicolao de Comitibus Patavino qui nostro tempore summus astronomus fuit in libello suo de mutatione aeris, capit. vii. . . ."

[23] These "notable matters" are in a sense distinct from the sixth chapter, for at fol. 35r of Laud. Misc. 535 we read, ". . . et est finis huius sexti capituli. Sed antequam veniam ad reliqua duo capitula pro imperitis in arte astronomorum, ut dixi tibi tradam aliqua notabilia per me experta." The seventh chapter then does not open until fol. 37r.

chapter further divides into seven sections dealing with signs of heat, cold, drought, humidity, snow and hail, winds and storms, thunder, lightning, and coruscations respectively. In the last chapter,[24] which is divided into four sections, Nicholas turns from weather prediction to signs of other events such as earthquakes and floods, pestilence and epidemics,[25] fertility, sterility and famine, wars and battles.[26]

In addition to earthquakes Nicholas discusses volcanoes. He argues that earthquakes occur less in islands far remote from land and surrounded by the great sea than in islands nearer shore.[27] He explains that he will treat only of particular floods, since all theologians agree that there have been and will be only two general or universal deluges: namely, Noah's flood and "that other deluge of fire to come at the end of the world."[28] His section on earthquakes and floods is to a large extent historical in character. He cites pope Gregory the Great concerning the great flood in Italy on November 1, 586 A.D., which killed many people and caused the Tiber to overflow the walls of Rome, while at Verona the Adige reached the upper windows of the church of S. Zeno.[29] Of earthquakes he proposes to list all the notable past instances of which there is any reliable record.[30] He begins with that of 424 B.C. "among the Locri" when Atlantis was cut off and made an island, and the eruption of Mount Etna in the year preceding. He lists others for 328, 221, and 15 B.C., and for A.D. 32 at the time of Christ's passion, 59 at Rome under Nero, 107, 115, 122, 131, 305, 308. In 453 A.D. there were repeated earthquakes, comets, and various signs in the sky "in the time of Attila, the scourge of God." More

[24] S. Marco VIII, 78, fols. 73v-96v: Laud. Misc. 535, fol. 51v *et seq.*

[25] S. Marco VIII, 78, fol. 79v. The remaining citations will apply only to S. Marco VIII, 78.

[26] S. Marco VIII, 78, fol. 91r.

[27] *Ibid.,* fol. 77v.

[28] *Ibid.,* fol. 75r, "aliud diluvium ignis venturum in fine saeculi."

[29] *Ibid.,* fol. 76r.

[30] S. Marco VIII, 78, fol. 78r, "Tamen hic intendo narrare omnes terraemotus praeteritos notabiles de quibus veritas haberi potuit." His account of them runs on to fol. 79v. Giannozzo Manetti had earlier listed 210 past earthquakes in his work on that of 1456 to Alfonso V; see our chapter, "Comets and Courts."

recent earthquakes were in the years 1000, 1131, 1241, 1279, January 25, 1347, and those indicated by the comets which appeared in 1456 and 1457.

In connection with the subject of pestilence Nicholas lets fall some interesting medical observations. He cites Peter of Padua's (i.e. Peter of Abano) commentary on the *Problems* of Aristotle[31] and gives the marvelous remedy and sure cure[32] against the plague which John of Oxford (i.e. John Eschenden) mentioned at the time of the Black Death in 1348. Nicholas defines the pest and explains the derivation of the various terms employed for it as follows.

Pestilence is a contagion which, while it seizes one person, rapidly spreads to many. Moreover it is called *pestilentia* as if *pastulantia,* and like a fire it feeds as it descends through the whole body. And it is called contagion from *contingendo* since it pollutes whatever it has touched. Also it is called *inguinaria* from striking the groin and is named *lues* from *labes* and *ictus,* for it is so sudden that there is no interval of time to mark off infection or death, and sudden languor comes together with death.[33]

Signs of the approach of plague are the multiplication of frogs and mice, the coming of subterranean animals to the surface of the ground, and boys in their play holding funerals.[34]

Nicholas asserts that contagion may be spread by water as well as air. "Water sometimes is corrupted and produces bad and pestiferous diseases because when taken into the system it remains there longer than air does."[35] Waters may be corrupted by dead fish, by leaves and trees decaying in them, by lying long

[31] *Ibid.,* fol. 80v.

[32] *Ibid.,* fol. 86r, "Et non est inventus aliquis qui sumeret de ista pulvere qui non evaserit, praeservat enim hominem ab aere infecto et corrupto."

[33] *Ibid.,* fol. 79v, "Pestilentia est contagium quod dum unum apprehendit celeriter ad plures transit. Dicitur autem pestilentia quasi pastulantia et sicut incendium depascat dum descendit per totum corpus, et contagium a contingendo quoniam quae tetigerit polluat. Ipsa etiam ab inguinum percussione inguinaia dicitur et lues a labe et ab ictu vocata quae tantum acuta est ut non habeat temporis spacium quo aut victa separetur aut mors, et repentinus langor simul cum morte venit."

[34] *Ibid.,* fol. 85r.

[35] *Ibid.,* fol. 83r, "Dico etiam quod aqua aliquando corrumpitur et facit malos morbos et pestiferos quia assumpta diu quiescit interius quam aer."

stagnant in the sun, by flowing through mineral deposits or other corrupt bodies, "and from many other causes." So a change in drinking water is more likely to affect one's health than a change of food is.[36]

Finally may be noted a passage[37] illustrating to what extent the circulation of the blood was recognized in Nicholas's time. When a man breathes, the heart receives the air from the lung in the right ventricle and separates the pure from the impure which returns to the lung and is expelled by the breath. From the pure air the heart manufactures good vital spirits. But if the air is infected and corrupt, the heart generates corrupt spirits:

And in like manner the aforesaid arterial blood is made corrupt and impure; moreover, those corrupt spirits together with the said arterial blood are sent through the said left ventricle of the heart and the said smaller arteries to all the members of the body.[38]

Thus the entire body becomes corrupted. Some of the thick, corrupt air does not enter the heart but surrounds it and fills the enclosure of the heart, or, when it enters the heart, is so thick that it immediately suffocates the heart and sudden death results.

Before closing this chapter we may note one or two other works of an astrological character from the middle of the fifteenth century. Upon Christmas day, 1444, Nicolaus Karlo of Venice published there a prediction for the ensuing year, 1445. There was to be a conjunction of Saturn and Mars and other unfortunates in Cancer on August seventeenth, but Nicolaus predicted a Christian success against the Turks. He also touches on the weather for the coming four seasons, diseases, politics, and the church. He opens and closes devoutly, and repeats the familiar saying or doctrine that the human body is subject to the heavenly

[36] *Idem,* "et ex multis aliis causis corrumpuntur aquae. Unde magis aegritudinalis est mutatio aquae quam ciborum."

[37] *Ibid.,* fol. 82r-v.

[38] *Ibid.,* fol. 82v, "Et similiter sanguis arterialis praedictus efficitur corruptus et impurus; illi autem spiritus corrupti una cum sanguine arteriali praedicto mittuntur per praedictam auriculam sinistram cordis et per praedictas arterias subtiles ad omnia membra corporis."

bodies, but the intellect is constituted under the angels, and the will under God.[39]

A judgment for the year 1451 by master Martin de Przemislia, doctor of medicine, is preserved in a manuscript at Cracow.[40]

It is no long step from recording past events to predicting coming occurrences, and perhaps the converse is true. The leaves of a calendar offer a handy place for jotting down things as they happen. Similarly in a manuscript collection of Ephemerides or tables of the positions of the planets from 1442 to 1473,[41] occasional notes in the margins record past events. Partly these jottings are of a personal nature, recording the writer's own goings and comings or the birth of a son. An earthquake and "terrible percussion of winds" are also noted, and sometimes historical happenings as in this item. "November 10, 1449. On this day the king of France entered Rouen with great solemnity. November 18, 1449. On this day there was a great disputation held among the Preachers." Sometimes horoscopic figures in the margins attest the writer's astrological as well as historical interest.

[39] BU AV.KK.VIII, 29, fols. 147r-150r, in a neater hand than the preceding texts and on different paper—the volume being a collection of printed and manuscript annual prognostications. Incipit: "In exordio dictionis accidentium futuri anni 1445 imperfecti recolere preponimus quod gloriosus deus et sublimis dominus seculorum omnia inferiora propter hominem creavit. . . ." At fol. 149v, "Finis itaque noster sit laus et reverentia creatoris," leaving the lower half of the page blank, but on fol. 150r we read further: "Nycolaus Karlo natione Venetus ex autoritatibus astrologorum hec pauca composuit. Est tamen deus gloriosus et benedictus in secula qui scit omnia antequam fiant. Divulgatum fuit in anno 1444 in festo sanctissime nativitatis domini nostri Yhesu Christi die XXV decembris in hac inclita civitate venetiarum."

The component tracts of this volume (of which I shall make much use in Chapter 58) are listed by E. Pèrcopo, "Pomponio Gàurico umanista Napoletano," Società reale di Napoli, *Atti della reale accademia di archeologia lettere e belle arti,* XVII, ii (1893-1896), Appendix 5, pp. 90-96, "La raccolta bolognese di pronostici astrologici, 1445-1506."

[40] Univ. Cracow 1918 (BB.XXV.7), paper, 1447-1451 A.D., fols. 367-399.

[41] BN 7301, paper, 17th century according to the old catalogue but I should call it fifteenth.

CHAPTER L

THEOLOGY AND ASTROLOGY

Somewhat similar in title and purpose to the *Natural Theology* of Raymond of Sebonde on the one hand and to the *Trilogy of Astrology Theologized* of Gerson on the other is a third work of the same fifteenth century—*A Compendium of Natural Theology Taken from Astrological Truth* by a curate—or else someone named Curatus—of Ziessele near Bruges.[1] Simon de Phares speaks under the year 1414 or thereabouts of a master Jehan de Zerixe, a German of Tournai, who was a theologian and astrologer and sent on various embassies.[2] If we turn to documents of the university of Louvain for information, we find a Baldwin of Zierixea or Ziericxzee in canon law in 1445 and rector in 1453 and 1458.[3] But it is not very likely that either of these is identical with our Curatus de Ziessele.

The sole manuscript of this *Compendium of Natural Theology* to which I have had access and which is at present known to me, seems to give only the first chapter or part concerning the proportion of the order of the universe which was published in the shape of a disputation at Louvain,[4] whether before or after the foundation of the university there in 1425 is not definitely stated, but we naturally associate such a disputation with a university. If this be the case, our treatise would be later than those of Gerson and Raymond of Sebonde. Our manuscript adds that this first part is commonly followed by a treatise on the proportion of the motion, light, and influence of the heavenly

[1] BN 7377B, 14-15th century, membr. and chart., fols. 126r-140v, Curatus de Ziessele iuxta Brugas, Compendium theologiae naturalis ex astrologica veritate sumptum.

[2] *Recueil* (1929), pp. 248-249.

[3] E. Reusens, *Documents relatifs à l'histoire de l'université de Louvain,* Louvain, 1903, I, 131, 256-257.

[4] BN 7377B, 14th-15th century, membr. and chart., fol. 140v, "Et hec de proportione ordinis universi edita necnon disputata louvanii per curatum de ziessele iuxta Brugas."

bodies[5]—a point briefly touched upon in anticipation in the text we have, which indeed seems to give a sufficient inkling of the general direction of its author's thought.

The curate of Ziessele is not primarily interested, like Raymond of Sebonde, in demonstrating the truth of Christianity from the natural universe, but rather in showing that astrology and astronomy demonstrate the unity and harmony of the universe both spiritual and material. And where Gerson tried to theologize astrology, that is, to render astrology acceptable to theologians, our author essays rather to astrologize theology and to make theologians accept astrology. Especially his aim is to exalt and justify astrology, placing it on a level with theology and natural philosophy as three interrelated sciences whose representatives ought not to speak ill of one another but between which there should be the closest harmony.[6] He regards his effort in the particular form which he gives to it as an innovation—"this new opusculum or compendium of natural theology from astrological truth, not found hitherto, an original theory."[7]

A striking characteristic of our treatise is the prominence given in it to the conception of proportion which had enjoyed such favor in the fourteenth century. The author proposes to write of the order and proportion of the universe, of the proportion between Creator and creature, between the celestial movers and mobiles, of the proportion of the motion, light, and influ-

[5] Immediately following the closing words quoted in the preceding note, we read, "Hic communiter debet sequi tractatus de proportione motus luminis et influentie celestium corporum." See also fol. 135v, "Quos errores cum sint famosi in sequenti tractatu ubi de proportione motus luminis et influentie agetur celestium corporum conveniet particularius reprobare."

[6] *Ibid.*, fol. 140r, "Patet igitur ex predictis concordia inter philosophos naturales, astrologos, et doctores sanctos quorum tres distincte dicuntur esse scientie adinvicem connexe iuxta triplicem ordinem nexus universi. . . . Nec una debet alteri iniuriam aut blasfemiam facere sicut quibusdam placuit. . . . Sed inter has tres scientias summa debet esse proportio et vinculum amicitie operandum in ordine universi. . . ."

[7] *Ibid.*, fol. 126r, "Hoc novum opusculum seu naturalis theologie compendium ex astrologica veritate hactenus non (or possibly, *vero*) inventa originaliter sumptum." If we read the abbreviation as *vero* rather than *non*, the meaning would be that our author had made an original synthesis from astrological truth as discovered to date. The passage may be regarded as the incipit of our treatise.

ence of the heavenly bodies, of the proportion of the highest Trinity and the mobile heavens, of the proportion between the creative and conservative action of God, and of the proportion of each and every order in the universe. He enunciates such propositions as that "in the sphere of the universe is a proportional and true nexus of high, low, and middle. For the celestial bodies are subordinated to spiritual beings, and mixed bodies to the celestial, in a most fitting way and order according to the rule of three as if modelled after the holy Trinity."[8] Such analogies to and mentions of the Trinity[9] are almost as frequent in our treatise as are allusions to the concept of proportion. In addition to trios are introduced groups of four, such as the *primum mobile,* starry firmament, spheres of the planets, and spheres of the four elements. These four constitute the celestial order, but we are told that there is no proportion between its extremes; this must be sought through the means which share the nature of their extremes.[10] In other words, the *primum mobile* has no direct action on the four elements but only through the other heavens. And as the *primum mobile* acts through the medium of the firmament, and the latter cannot influence without the mediation of the planets, so there is neither motion without light nor light without influence.[11] Despite our author's claim to originality his arguing from means and extremes reminds us of the theories of Perscrutator and others.

Our author's scheme of things is most readily intelligible in the graphic form which he has given to it of a "Table of the Proportion of the Order of the Universe." Here twelve classes of beings are arranged in three groups of four each and in four groups of three each. The highest group of four, made up of the prime mover, intelligences of the first hierarchy, movers of

[8] *Ibid.*, fol. 127v: "Prima propositio. In spera universi est proportionalis et verus summi medii et infimi nexus. Nam celestia corpora spiritualibus et corpora mixta celestibus penes ordinem ternarium tanquam sancte trinitatis vestigium ordine et modo congruissimo sunt subordinata."

[9] See especially the heading, "De cognitione superne trinitatis ex puris naturalibus," and the analogy of *esse, posse,* and *agere* to the Trinity.

[10] *Ibid.*, fol. 129v.

[11] *Ibid.*, fol. 130r.

the orb or second hierarchy, and angels or last hierarchy, passes from the order of intelligibles to that of spiritual beings. The middle group, consisting as above stated of *primum mobile,* starry firmament, planetary spheres, and spheres of the four elements, marks a transition from the order of imaginables to that of material spheres. The lowest group, comprising man, irrational animals, vegetation, and inanimate nature, passes from the order of sensible things to that of mixed bodies. This gives us associated in trios God, the primum mobile, and man; the Intelligences, Firmament, and beasts; the movers of the orbs, planetary spheres and planets; angels, elements, and minerals. But the chart itself will make matters clearer. On the basis of this arrangement of orders of being our author feels that everything is rendered ship-shape and explicable. For example, man is first in the order of mixed beings, and nature's most perfect work is generated from seed. On the other hand, the lowest or inanimate group of mixed beings and the most remote from perfection are generated without seed. Of the two intermediate groups of sensible creatures and vegetation the perfect ones come from seed, and the imperfect without seed, while some of a half-way sort may be generated in either way.[12]

Curatus de Ziessele does not hesitate to charge great writers of the past with errors, notably Albertus Magnus. He criticizes Albert in commenting upon the twelfth book of the *Metaphysics* for having declared the aqueous heaven purely physical and separate from the *primum mobile.* To declare it distinct from the *primum mobile* is, to our author's mind, to remove all trace of the Trinity from the heavens and to upset the order and proportion of the whole universe. Albert is further criticized for holding that the stars act only as instruments and do not exert a substantial influence on inferiors, and for not ascribing forms but only figures and specific "complexions" to the stars. Our author promises to expose these errors more fully in the following treatise which is not found in our manuscript. He furthermore

[12] *Ibid.,* fol. 137v. For the chart see opposite page.

TABULA DE PROPORTIONE ORDINIS UNIVERSORUM

	ESSE PRIMARUM	ESSE ASSISTENS	ESSE PROCEDENS	ESSE DISTANS	
ORDO INTELLIGIBILIUM	Primus motor Primus generans	Intelligentie Prime ierarchie	Motores orbium Secunde ierarchie	Angeli Ultime ierarchie	ORDO SPIRITUALIUM
ORDO YMAGINABILIUM	Primum mobile Celum crystalinum	Firmamentum Celum stellarum	Celum septem planetarum	Celum 4 elementorum	ORDO CELORUM
ORDO SENSIBILIUM	Homo vel humana natura	Sensibilia Irrationabilia	Vegetabilia vel plante	Mineralia Inanimata	ORDO MIXTORUM
	ESSE SUPERIUS	ESSE INFERIUS	ESSE INFIMUM	ESSE SUBINFIMUM	

criticizes Ptolemy and Alfonso for placing the signs of the zodiac in the ninth sphere or *primum mobile,* because this is equivalent to ascribing to the *primum mobile* that corruption which the contrariety of the signs necessitates but which is repugnant to the nature of the *primum mobile.* Similarly the Platonists are censured for supposing God to be the world soul or direct mover of the heavens, whereas God cannot be the cause of corruption.[13] It arises in the spheres of the elements because of their distance from the *primum mobile* and their faulty capacity for receiving the celestial influences.[14]

Our author should of course not be censured for it more than his contemporaries, but what an imperfect conception of divine omnipotence, omniscience, and ubiquity is that which would exempt the deity from responsibility on the ground of distance or intervening mediums. The whole situation was mathematically and spatially absurd and incongruous because the dimensions of the all enclosing and encompassing empyrean heaven were so vast and so much nearer to the inner corrupt spheres than to its own diametrically opposed parts, to say nothing of having a universe with a divine and holy rind but rotten at the core. Saner was the mysticism of a Nicholas of Cusa that saw no difference between the center and circumference of the universe and would merge both in God.

Our author endeavors to maintain his argument by both philosophical[15] and theological reasoning,[16] by authority[17] and by experience.[18] But it is evidently the influence of the stars that he has most at heart. Towards the close of the treatise he bursts into a long peroration repeating its praises in a series of sentences of which each begins with the words, "This is the virtue. . . ."[19] "This is the virtue of superior movements to which it is necessary that this inferior world be contiguous in order that all its virtue may thence be governed, as saith the Philosopher. This is that virtue by which the work of natural propagation is distinguished from that of the original instauration of the world, as saith Augustine. For this is the virtue of universal causes from whose continual radiation which penetrates all things the beginnings of forms are universally caused in first matter, as saith Albertus." And so on for many others, in the course of which our author affirms that it is by this celestial virtue that the magnet attracts iron, that the embryo lives the life of a plant before the infusion of the soul, that from the moment of conception the specific and individual *complexio* is impressed, and that not only the bodies but in consequence the souls of men are inclined, though without necessity, to various dispositions (*mores*).[20] "What marvel if from a fault of this sort of the sensible powers caused by the influence of the celestial bodies there follows a fault of the intellectual virtues proportioned thereto." Which is the reason why physiognomists have said that the virtues of the soul follow the *complexio* of the body.[21]

As Curatus de Ziessele sought natural theology from astrological truth, so the Dominican friar, Giovanni Nanni of Viterbo, later in the century, sought to show that astrological science was in harmony with and confirmed scriptural revelation. Iohannes Nannius or Annius of Viterbo, as he sometimes called himself in humanist style, lived from about 1432 to 1502. He had been trained as a Dominican in Greek and Hebrew, and was interested and erudite alike in history, theology, and astrology. Thus he illustrates the connection of humanism with astrology as well as the association of astrology with theology. He is

[13] Of the five errors listed in the above paragraph and found at fol. 135r-v of our MS, that of Ptolemy and Alfonso comes second, that of the Platonists third.

[14] BN 7377B, fol. 137r.

[15] *Ibid.,* fol. 131r, "Declaratio predictorum philosophica ratione."

[16] *Ibid.,* fol. 132v, "Declaratio predictorum ratione theologica."

[17] *Ibid.,* fol. 138r, "Declaratio predictorum ex auctoritate."

[18] *Ibid.,* fol. 136r, "Declaratio predictorum experimentali ratione."

[19] *Ibid.,* fols. 138v-139r.

[20] This view is ascribed to Augustine: fol. 139v, "ut dicit Aug. 7° confessionum." But I do not know of such a passage in the works of Augustine. Our author has perhaps been misled by a gloss of some later writer upon the sixth chapter of the seventh book of the *Confessions* in which Augustine recounts his conversion from belief in astrology: "Iam etiam mathematicorum fallaces divinationes et inpia deliramenta reieceram. . . ."

[21] BN 7377B, fols. 139v-140r.

said to have been dear to popes Sixtus IV and Alexander VI, and became master of the sacred palace in 1499.[22] He has won an unenviable reputation as a literary forger by his pretended recovery of the lost work of Fabius Pictor, the earliest Roman historian, which he recomposed from his own imagination and published with commentaries which he admitted were his own, in 1498.[23]

Of the work by Annius with which we are here concerned[24] the last or astrological section appears to have been composed first. He states more than once that he read it publicly in the church of the Dominicans in Genoa in 1471, as almost the entire nobility of Genoa can testify, and dedicated it to cardinal Niccolò Fortiguerra of Pistoia and Theano.[25] It was apparently

[22] Ferdinando Fossi, *Catalogus codicum saeculo XV impressorum qui in publica Bibliotheca Magliabechiana Florentiae adservantur,* 1793-1795, 3 vols., says of him: "Viterbi natus, Dominicanum institutum adolescens sectatus est. Linguarum latinae graecae et orientalium theologiae et historiae peritia claruit, et Romanis Pontificibus Sixto IV et Alexandro VI adprime charus exstitit unde et sacri Palatii Magister adlectus fuit. Plura scripsit haud mediocri eruditione referta sed falsarii nota a viris cordatis ei recta inuritur quod confictos antiquitatum libros ceu genuinos antiquorum foetus litterariae Reipublicae obtrudere non dubitaverit."

[23] *De aureo saeculo et origine urbis Romae, cum commentariis Annii Viterbiensis,* Rome, 1498.

[24] I have used what appears to be the editio princeps of 1480 (BM IA. 31960): *Ad beatissimum papam Sixtum et reges ac senatus christianos de futuris christianorum triumphis in Saracenos Epistola magistri Ioannis Viterbiensis incipit,* per Baptistam Cavalum Genue die VIII Decembris 1480, 48 fols. This edition opens with a table of contents and lacks the titulus, *Glosa super Apocalipsim de statu ecclesie ab anno salutis presenti scilicet 1481 usque ad finem mundi . . .*" found in some later editions and in a manuscript copy, BN 7335, made at Paris in 1487 (see fol. 135v) "pour maistre Jehan Roussel" (fol. 166v, col. 2). In this MS the table of contents is found at fols. 136r, col. 2-138v, col. 2, the aforesaid titulus at fol. 144r, and the first two tractates at fols. 144r-166v, where the MS ends, while the third tractate occurs at fols. 134r-135v.

De futuris christianorum triumphis in Saracenos, however, seems to be the proper title for the work rather than *Glosa super Apocalipsim de statu ecclesie,* since it occurs on the title page of some editions and is found with slight variations in wording in the colophons of all, either at the close of the table of contents, "Expliciunt capitula . . ." or at the end of the work.

[25] BM IA. 31960, fol. a iiii recto, "Tertio replicabimus brevissime tractatum de imperio Turchorum quem ferme ante hos novem annos Genue populo in ecclesia sancti Dominici legi et ad dominum Nicolaum olim Theanensem cardinalem dedi. Explicit prephatio"; fol. f iii verso, "Fere octo anni elapsi sunt quibus legi Genue tractatum sequentem quem dedicaveram domino Nicolao Pistoriensi sancte Romane ecclesie cardinali Theano vulgariter nuncupato . . ."; fol. (f vii) recto, "Hec non sunt noviter pronuntiata sed publice scripta et lecta a me M CCCC LXXI in ecclesia nostra in lectione publica ut testis est fere tota nobilitas Genue."

much later that he prefixed to this two further sections on antichrist and an interpretation of the *Apocalypse.* However, he had already at some unstated date read at Genoa that section of it which discussed whether antichrist had yet appeared.[26] On March 31, 1480, he completed the work and early in April he sent copies to pope Sixtus IV and other sovereigns and senates of Europe. Failing to elicit any response from them, he turned to the general reading public, and the first edition appeared at Genoa on December 8 of the same year with a prefatory letter to the pope and other rulers giving the facts which we have just stated.[27] Annius's assertion in it that many had been seeking copies of the work seems[28] to have been no idle boast, for at least half a dozen more editions at as many different places—Gouda, Leipzig, Louvain, Cologne, Nürnberg, and Paris—had to be issued before the close of the century, and there was still another at Cologne in 1507.

Antichrist, the *Apocalypse,* and astrology proved a winning combination and best seller, especially since Annius had cleverly linked up the three with the present interest of the Turkish menace. He argued that antichrist had already appeared in the person of Mohammed and that Islam was the beast of *The Book of Revelation.* The first fifteen chapters of the *Apocalypse* ap-

[26] *Ibid.,* fol. a v verso, "Hanc quam super apochalipsim Genue legi questionem libens redegi in scriptis. . . ."

[27] *Ibid.,* fol. (f viii) recto, "Ex Genua M CCCC LXXX° die XXXI martii in Sabbato sancto completum. Impressum Genue eodem anno die VIII decembris."

[28] *Ibid.,* fol. a iii recto, "Et quoniam a compluribus copia petitur idcirco iterum et copiam mitto et editionem."

Thus *copia* is used not merely for a single manuscript copy but apparently for publication in manuscript form in a number of copies in contrast to the printed *editio.*

That Annius was not the only Dominican discussing the theme at this time is indicated by the following publication: BM IA. 7939, "Explicit tractatus collectus anno domini M CCCC LXXIIII a quibusdam fratribus ordinis predicatorum de presenti afflictione ecclesie illata a Turcis declarans per autenticas scripturas quomodo ipsa sit presignata et propter que peccata christianorum sit inflicta et quando sit finienda. Impressus anno domini M CCCC LXXXI Nuremberge per Conradum Zeninger."

plied to the period before the fall of Constantinople in 1453. "The true antichrist is the pseudo-prophet Mahomet, and the beast is his sect." His interpretation of the sixteenth chapter, with which his second tractate opens, is that because of schisms from the obedience of the Roman pontiff and because of heresies the eastern church is to be scourged by the pseudo-prophet Mahomet under seven kings of the Turks in Arabia, Africa, Libya, Numidia, Spain, Palestine, and all Asia. The seventeenth chapter includes the first half of Europe in the same fate. But, as the eighteenth chapter shows, when all the church not subject to Peter has been thus scourged by the Saracen beast, an emperor of Constantinople will be instituted by the pope who will recover Constantinople, Asia Minor, and even to Egypt. Then in accordance with the nineteenth chapter of *The Book of Revelation* all the schismatic churches of the orient will rejoin Rome, Arabia will be invaded, the bones of the Prophet scattered, and Africa, Asia, and well-nigh the whole world converted to Christianity. Then a Christian monarchy will rule in peace for a thousand years, when the Mohammedan beast will rise again and after three hundred and thirty-three and a half years will fight victoriously for three years and a half against Christianity until Christ miraculously destroys the host of Islam near Mount Olivet. The twenty-first and twenty-second chapters of the Apocalypse are interpreted more literally.

We then turn to ten astrological conclusions. Divine providence rules this inferior world through superiors and controls the celestial movements and all visible and invisible creatures through the angels. It is not contrary to the faith to say that God punishes men by famine, pest, and invasions of the infidels through the natural influence of the stars and the execution of the common law of angels. It may be that papacy and Christian empire are ruled specially by the Holy Spirit yet, as our sins demand it, even the church is abandoned to the evil influences of the heavens. By ordination of the Creator the sign Leo governs Christians and Turks, its first fifteen degrees serving the Turks, and the other fifteen serving Christians especially those of Italy,

Hungary, and France. The maximum influence of each sign lasts a thousand years. A great circle dominates for as many years as it has degrees, namely, three hundred and sixty, a half of which is one hundred and eighty. Nannius reckons that such a period of one hundred and eighty years will terminate in 1480 A.D., and that then it will be the Christian world's turn and that the Turkish empire will begin to decline. It is thus that astrology substantiates the conclusions which our author drew from the *Apocalypse*. Nor does the recent landing of the Turk at Otranto daunt him. Rather he hails it as a good omen, for as the fall of Troy first came from Apulia, so he believes that the destruction of the Turks will be begun by a prince of Apulia, and if king Ferdinand lives long enough, he will become more famous than Alexander.

Gregory Crispus, a philosopher of Toulouse and the author of a *De cultu humanitatis et honestatis libellus* written in a very religious tone to a future cardinal at some time between 1464 and 1476,[29] was also the author of an invective against the stupid detractors of astrology.[30] Some persons condemn it as if there were no difference between an astronomer and a magician, but it is recognized as one of the seven liberal arts and approved in all Christian gymnasia and universities. It is foolish *not* to try to learn the future. Prophets, apostles, and Christ himself cultivated it. The long lives of the patriarchs enabled them to lay the necessary foundations of astronomical observation. David said that the heavens declare the glory of God; their observations of the stars led the three Magi to knowledge of the true star; the eclipse at the time of the crucifixion converted Dionysius the Areopagite to Christianity. In brief, all the most erudite theologians agree with the philosophers that God infuses life in

[29] It is discussed in Chapter XI of my *Science and Thought in the Fifteenth Century*, 1929.

[30] FL Plut. 77, cod. 17, fols. 110v-116r: "Gregorii Chrispi sapientis tholosani bonarum artium et utriusque philosophie studiosi Invectiva in eos insulsos homines qui astronomie arti quidem prestantissime dictis mordacibus ac salibus detrahunt feliciter incipit . . . / . . . Qui igitur detestanda impudentia et temeritate astronomiam eiusque cultores damnant eos dementes immo beluas appellandos censemus. Vale."

these inferiors by the ministry of the heavens and that these govern human bodies.

A rather interesting summary of previous opinion, especially medieval, concerning the heavens and spirits was printed by Conrad Wimpina of Buchen (1465-1531)[31] shortly before the close of the fifteenth century. Some might class Wimpina among German humanists. He was praised by his contemporaries as a poet and orator, and his first published work was on rhetoric, oratory, and letter writing.[32] But he was to be primarily a theologian and in the sixteenth century to support Tetzel and Eck and oppose the Protestants at the Diet of Augsburg. At the time of writing our treatise, he already possessed the degree of bachelor of theology as well as master of arts at Leipzig and was probably well advanced in his studies towards the doctorate.[33] It was after completing a treatise on the nobility of Christ[34] that he turned to the theme of the nobility of the celestial spheres and their movers or souls as a fitting complement to the other. Wimpina necessarily does little but repeat views which we have already met elsewhere, since he states his purpose to be a succinct condensation of a very broad subject and describes his method of exposition as superficial and elementary rather than

[31] On the various forms of Wimpina's name or names found in the university and other records see Nikolaus Müller, "Ueber Konrad Wimpina. Eine Quellenstudie," *Theologische Studien und Kritiken* (1893), pp. 83-124. His family name was Koch, or, in Latin, Conradus Coci de Buchen alias Wimpina.

[32] *Precepta augmentandae (coaugmentandae?) rhetoricae orationis commodissima et ars epistulandi,* c. 1486-1487, Hain 16202: Müller (1893), p. 96, and Joseph Negwer, *Konrad Wimpina ein katholischer Theologe aus der Reformationszeit,* Breslau, 1909, pp. 13-14, 200.

[33] Müller (1893), pp. 86-87, shows that Wimpina became master of arts in 1485-1486, *cursor* or bachelor of theology in 1491, *sententiarius* or lecturer on the *Sentences* in 1494, licentiate in 1502, and doctor in 1503. The words, "iampridem . . . editi" in the title of our treatise suggest, however, that it was composed sometime before it was printed. The full title page reads as follows: "Tractatus utilis et admodum iucundi iampridem a magistro Conrado Winpina Buchensi ex diversis editi. De nobilitate celestis corporis. De eo an animati possint celi appellari. De nobilitate animarum celi." The edition is undated but is placed at Leipzig about 1499. It has 52 leaves. At the close is the emblem of the printer Martin Landsberg of Leipzig but no colophon.

[34] The *prologium* opens on fol. a. ii. recto, "Cum superioribus diebus nonnihil de Christi reparatoris et glorificatoris nostri pientissimi nobilitate texuissem. . . ."

philosophical, so that it may be understandable by those who have advanced no farther than the *trivium* and are untrained in metaphysics. But he has achieved his task so cleverly and clearly that his little work deserves some notice. Moreover, it is more philosophical in character than his modest disclaimer might indicate. Indeed in the dedication to Johann Hennig, doctor of arts and theology and canon of Meissen,[35] it is less humbly represented as discussing the vexed but never hitherto sufficiently elucidated question of the animation of the heavenly bodies.

Besides this problem the work deals with two other chief themes, the composition of the heavenly bodies, and the extent of the knowledge possessed by the intelligences that move the orbs and by other spirits. These three questions form the main subject of the three parts or "Codicils" into which Wimpina's work divides.[36] The question of the composition of the heavens, whether they are material at all, and if so, of what sort of matter composed, naturally comes first. Plotinus and the *Timaeus* of Plato are used as well as Aristotle and Averroes. The last named is said to have accounted for the incorruptibility of the heavens by their immunity from matter, but other scholastics, whether influenced by the authority of the *Book of Genesis* in which one matter is ascribed to all things, or convinced by truth, denied that mere extension and sensible quality of the sky could exist apart from matter and consist of form alone. They therefore made the heavens material but disagreed as to whether celestial and inferior bodies were constituted from the same matter. Some held that they were but explained the incorruptibility of the superior bodies by their freedom from any tendency to take on another form. Whereas Aristotle made the eighth sphere the primum mobile, "the later astronomers of our age" add a ninth and tenth sphere in order to account for three motions which they see in the eighth sphere. Alfonso the Wise made the tenth sphere the primum mobile, com-

[35] This occupies the verso on fol. [a.]

[36] At fol. c. ii. verso begins, "In codicillum secundum de eo an animati sint celi prologium;" at fol. f. iii. recto, "In codicillum tertium de nobilitate motricum orbium sive celi animarum prologus." The first part had ten chapters, the second fifteen, and the third nineteen.

pleting one revolution every twenty-four hours. The ninth sphere has its ecliptic always coincident with that of the primum mobile, but the head of Aries moves on poles, distant from those of the world by 23 degrees, 33 minutes, and 30 seconds, at the slow rate of four thirds a day, or one degree and twenty-eight minutes in two hundred years, completing an entire revolution, "philosophically speaking," in the course of 49,000 years. In addition to following these two motions of the primum mobile and ninth sphere, the eighth sphere of the fixed stars has a movement peculiar to itself on two small circles opposite to one another in the ninth sphere, one above the head of Aries and the other above that of Libra. This motion of trepidation or access and recess is completed in seven thousand years.

The ancients held that the heavens were animated, but among the erroneous articles condemned at Paris—the reference seems to be to the 219 errors condemned in 1277—was to assert that the heavens are animated. Various interpretations have been put upon the dictum of Aristotle that the spheres are moved as by what is loved and desired. Avicenna imagined two souls in each celestial orb, one intrinsic by which it seeks its mover and delights in its course desiring assimilation to its mover, the other an assisting intelligence moving and impelling the orb by its command. Avicenna further held that each intelligence from the primum mobile on caused or created that of the next sphere, until one came to the moon, whose ruling intelligence was unequal to such creative effort but bestowed souls and substantial forms upon inferiors beneath its orb. Averroes rejected the hypothesis of an intrinsic soul in addition to the assisting intelligence, contending that it implied that the heavens were animated matter and corruptible, "for all that lives by life is generable and corruptible." Averroes held rather that the heavens were animated and alive *per se*. He said that as transmutation in substance makes us know first matter, so transmutation in place makes us know that these celestial substances have no matter. But this, as has been said before, is dissonant to the Catholic faith. Albertus Magnus supposed a threefold mover in the heavens: one wholly extrinsic to the

heaven moved, the second a form conjoined to the heaven but not divisible in its dimension. The third mover was the material form of the heaven divisible according to the division of the heaven and analogous to the force of gravity in earth or levity in fire—a tendency in short to circular motion. This appetite could not be intellectual, as is that of the second mover. The Thomists held that intellect and will of the moving intelligences were sufficient to account for the movement of the spheres. But the Scotists objected that to know and to will and to move locally were separate operations. They pointed out that the faculty of local motion was possessed by angels, beasts, and men, but that intellect and will were not common to those three. Further, that intellect and will do not constitute an object in real being. They also adduced the article of Paris which declares erroneous the opinion that an angel moves through intellect and will. They declared executive power essential to produce local motion and laid down this order in the process of moving: first, speculative intellect; second, complaisant will; third, practical intellect directing the operation; fourth, volition commanding it; and fifth, power executing it.

Returning to the question of the animation of the heavens and suggesting the familiar solution that a heavenly body is an animal but one quite unlike inferior animals, Wimpina concludes that the whole controversy and mass of conflicting opinions is not real but a mere matter of names. Nevertheless, to avoid all appearances of encouraging idolatry, instead of speaking of the souls of the heavens he will employ the more orthodox expression, intelligence or angel deputed by God.

These intelligences far surpass all inferior ones in nobility and perfection. They do not require senses for the attainment of their knowledge, yet it is not to be regarded on that account as confused. The author of *De Causis* represents each intelligence as knowing what is beneath it and what is above it. What is beneath it, since it is the cause thereof, and what is above it, since it acquires benefits therefrom according to its position. Averroes, commenting on the *Metaphysics*, asserts that each intelligence participates more in the knowledge of the supreme mover as it is nearer

in situation to the primum mobile. Thus the intelligence of Saturn is superior to that of Jupiter or Mars. Augustine said that the state of the heavens was first in the Word according to God's wisdom, then was produced in the spiritual creatures according to the wisdom concreated in them, and finally was made in its own genus as we see it. He also said that ideas of all things preexisted eternally in the Word and were forms impressed on spiritual minds before they were planted in this fluctuating world and sown seminally through the elements by the motion of the superior bodies according to number, measure, and weight. Many students of philosophy would limit the knowledge of a celestial intelligence to what is subject to its own orb. For instance, the intelligence of the moon would be cognizant only of those matters subject to the motion of the moon. But Wimpina believes this limitation to be unsatisfactory both philosophically and theologically. He thinks that no one will deny that the movers of the orb are at least cognizant of privations and their own imperfections. They know things in their species and according to those divine ideas and seminal principles which were implanted at creation. They also see quiddities and verities directly with no prerequisite inquisition of objects and apart from the phantasy which makes our human brains err. Some hold that the celestial intelligences differ among themselves in such powers, but very weighty authors are not wanting who believe that every intelligence has knowledge of all sensible and corruptible things, and that the only difference between them is that the superior intelligences know them in a simpler way and under fewer species. Others, however, contend that the heavens neither cause those phenomena which depend upon the individuation of matter, nor have the movers of the orbs any knowledge of corruptible individuals. The reply to this is that their knowledge is not through abstract generalizations such as the human intellect employs but through the very essences themselves. Indeed, some would have them know through the forms of genera rather than of species.

The fundamental astrological hypothesis of the causation of inferior phenomena by the heavens is constantly implied by Wimpina and is occasionally expressly stated, as in the dictum that "there is nothing in the condition of inferior bodies which is not caused by the agitation of celestial motion." But he rejects as irreligious the doctrine that each planet with its moving spirit shares the rule of the world in turn for 354 years and four months, and that thus are to be accounted for such miraculous events as the flood, overthrow of Babel and Sodom, or passage of the Red Sea.[37] In the margin this doctrine is ascribed to the *Conciliator* (Peter of Abano), *Differentia* 9.

On the other hand, Wimpina extends a favoring hand to demonology, with its probable concomitant of witchcraft, by arguing that the number of spiritual intelligences is much greater than the number required as movers of the orbs, whatever the number of distinct motions we assign, and by speculating as to what order in the hierarchy of spiritual beings the celestial movers belong. In closing Wimpina dwells upon the difficulty of his subject and asks the reader to pardon him if he has left some points in doubt and has contented himself with stating the various opinions held.

[37] This is discussed in chapter 17 of the third codicil.

CHAPTER LI

CENSORS OF SUPERSTITION

Adolph Franz, in his two volume work on ecclesiastical benedictions in the middle ages,[1] notes the appearance in the fifteenth century of numerous tracts by German university teachers against superstitious beliefs and observances. He names as the authors of such works Nikolaus Jauer, Thomas Ebendorfer von Haselbach, Nikolaus von Dinkelsbühl, Johannes von Dieburg or John of Frankfurt, Jodokus Heiler von Heilbrunn, Johannes Wünschelburg, and Heinrich Gorichem.[2] The works of most of the authors just named will presently be reviewed. But such writings were not confined to Germany, so that representatives of Italy and France will be added. The popular superstitions against which such authors wrote may be approached from another angle, and we therefore prefix to these specimens of learned censures some account of actual popular notions and observances as preserved in local record and tradition.

To give an idea of the popular superstitions and observances, often of primitive or pagan origin, which survived in varied forms in the different localities of western Europe into the fifteenth century, we may note some of the examples which Digot has collected in his history of Lorraine.[3] Digot has in part arranged them under such topics as marriages and funerals; we shall adopt a mode of presentation intended to bring out the different types of superstition in a more analytical way.

[1] A. Franz, *Die kirchlichen Benedictionen im Mittelalter*, 1909, 2 vols.

[2] *Ibid.*, II, 642. After listing these names, he adds, "deren Namen und Schriften in unserer Arbeit wiederholt genannt wurden," but, according to his index, Nikolaus von Dinkelsbühl, Jodokus Heiler, and Johannes Wünschelburg are noted only in this passage where their names are merely listed.

[3] Aug. Digot, *Histoire de Lorraine*, 1856, vol. III, Livre V, Chapitre IV, on the culture of Lorraine from 1431 to 1473, using to a considerable extent the earlier work of Richard, *Traditions populaires, croyances superstitieuses, usages et coutumes de l'ancienne Lorraine*, but also other sources.

All sorts of signs of the future were believed in. Whoever of the bridal pair rose first from kneeling would dominate the other.[4] If a screech owl, white barn owl, or magpie perched on the ridge-pole of a house, it portended the death of someone within. It was a very bad sign to meet a pregnant woman on leaving one's house in the morning; the only way to escape ill consequences was to insult her and retire indoors immediately.[5] It was considered unlucky to be born during the hour before midnight or on Good Friday.[6] There were also signs of the sex of the coming child. To predict the weather for the ensuing year, before going to midnight mass one put salt in twelve split onions representing the months of the year and on returning estimated the humidity of each month by the state of the salt in each onion. If one's head cast no shadow on the wall at the feast of Epiphany, one would not live out the year.[7] In certain villages it was the custom to take a handful of straw from the mattress of a dead person and burn it at the cross-roads. If there were a foot-print in the ashes, there would soon be a death in the house towards which it pointed, or, in the absence of such tracks, in that house towards which the smoke from the burning straw blew.[8]

Protective measures against sorcery were common, and included such procedures as putting a little water in the milk, or breaking the shells of eggs and snails which one had eaten.[9] At Martigny-lès-la Marche the bridal pair entered the church encircled by a chain of silver or of copper with silver-plating.[10] To get even with sorcerers who bewitched away the cows' milk, the milk was heated and a knife plunged in it. This was supposed to wound the sorcerer.[11]

Some traced a figure of king Solomon's ring on the foot of their beds to keep off nocturnal spirits, and others recited a passage from the Gospel according to St. John to guard against fairies and sorcery.[12] Surviving place names show how wide-

[4] Digot, III, 178.
[5] *Ibid.*, 181.
[6] *Idem.*
[7] *Ibid.*, 182.
[8] *Ibid.*, 180.
[9] *Ibid.*, 184.
[10] *Ibid.*
[11] *Ibid.*, 184.
[12] *Ibid.*, 187.

spread was the belief in fairies. The peasants attributed the medicinal virtues of certain fountains to them, and the best the church could do was to change the attribution to its saints.[13] Ghosts were feared, and in preparing a corpse for burial care was taken to stitch up the shroud.[14]

Charms were also employed as preservatives from lightning or disease. Eating an egg laid on Good Friday was thought to ward off fever for a year. Putting in one's bed a coal from the Christmas fire kept off thunderbolts.[15] Hen's eggs that were perfectly round, on the other hand, were smashed immediately under the persuasion that they had been laid by cocks and would hatch out serpents.[16] On the midnight of January first the peasants sprinkled themselves and their domestic animals with water to insure good health, and a bouquet of flowers was deposited at the fountain by the first-comer, or if none could be procured, a handful of straw was burned.[17] A cricket in a house brought good luck, and the head of a stag-beetle was a charm against lightning.[18]

Sex magic and agricultural magic were other forms of popular superstition. A white hen was borne before the wedding procession on the end of a pole,[19] as a symbol we are told, of the bride's chastity but more likely with the intent to insure it or for some other magical purpose. The women of the Vosges thought to insure quick delivery by wearing their husbands' clothing.[20] Peasants employed a ceremony and incantation to make the carrots grow large, touching the thigh while planting them and saying, "Long as my thigh, big as my head."[21] It was considered dangerous to plant during the full moon, and the crops would be poor if one came home from midnight mass by the light of the moon. On the other hand, marriages contracted during the waxing of the moon were believed to turn out best.[22] The time element was thus emphasized, as we have

[13] Digot, III, 186-187.
[14] *Ibid.*, 180.
[15] *Ibid.*, 181.
[16] *Ibid.*, 184.
[17] *Ibid.*, 185.
[18] *Ibid.*, 183.
[19] *Ibid.*, 177.
[20] *Ibid.*, 181.
[21] *Ibid.*, 183.
[22] *Ibid.*, 184.

seen also in the case of Good Friday, Epiphany, Christmas, and the New Year. And one must not sow hemp or make lye during rogation week.[23] The prohibition of lye-making applied also to Corpus Christi and All Saints'. To insure the success of an undertaking, one should deposit an eyelash in his shoes.[24]

Cats played a considerable part in the popular superstitions and usages of Lorraine. A girl who wished to rid herself of an unwelcome suitor would send him a cat,[25] or lay a broom before the door. When the villagers danced about the bonfires on the eve of St. John the Baptist or jumped over them and drove their domestic animals through them as a preservative from disease, it was customary to suspend one or two cats above the flames.[26] Black cats were suspected of attending witches' sabbats, and their tails were amputated to prevent this.[27] If the house cat died a natural death, someone of the household was believed likely to follow it soon.[28] It was a bad omen to meet a cat when starting on a journey.[29]

The virtue of herbs was associated with sorcery in the notion that persons given to magic should be especially watched towards St. John's Eve, when they were believed to scour the woods for herbs to use in their concoctions, plucking them with the right hand and throwing them into their basket without looking at them, lest they lose their virtue. The time factor was also important here, since it was advisable that the herbs be plucked while the clock was striking noon. Some villages near Lunéville rang the bell only two or three instead of twelve times in order to curtail the sorcerers' botanizing.[30]

While such popular superstitions and magical practices had presumably existed all along, the first condemnation for sorcery in Lorraine that Digot could adduce was in 1372.[31] Towards the middle of the fifteenth century there was still a hesitancy about sending to the stake all persons suspected of magic. Only

[23] Digot, III, 183 and 185.
[24] *Ibid.*, 184.
[25] *Ibid.*, 177.
[26] *Ibid.*, 182.
[27] *Ibid.*, 184.
[28] *Ibid.*, 180.
[29] *Ibid.*, 184.
[30] *Ibid.*, 192.
[31] *Ibid.*, 189.

after the fifteenth century did the number of sorcerers, or at least the number of condemnations to death, mount rapidly[32] —a generalization which seems to hold true of the witchcraft delusion elsewhere.

Jacques le Grand, or Jacobus Magnus, was an Augustinian of Toulouse who was at Paris in 1405 and dedicated to Michael, bishop of Auxerre (1390-1409) and confessor to Charles VI of France, his *Sopholegium*. This moral encyclopedia in three books appears to have been his chief work[33] and was printed a number of times before 1500.[34] The first book deals with certain matters leading to the love of wisdom; the second book is concerned with love of the virtues; the third book treats of various circumstances in which men find themselves and subdivides into tractates on death, how ecclesiastics should care for those under them in morals and the sciences, on the clemency of princes, and on the state of the people. It is in the first book, before he turns to its second tractate concerning the liberal arts, that James has a section on the magic arts.[35]

James holds that the magic arts are nothing but seductions and inventions of the devil. He affirms that seven such arts are usually named: geomancy, hydromancy, aerimancy, pyromancy, chiromancy, armomancy,[36] and nigromancy. But I do not remember to have seen this limited list in other authors. Such arts are very superstitious, false, prohibited, and frivolous, but since the lovers of such arts would hold that James's censure was arbitrary and prejudiced unless he gives some reasons,[37] he discusses them a

[32] *Ibid.*, 191.

[33] I have read it in a MS at Geneva, 994 (90 in Senebier's catalogue) of 265 leaves. It opens, "Illustrissimi principis regis francorum devotissimo confessori domino Michaeli divina providentia episcopo. . . ." The second book begins at fol. 47v; the third, at fol. 174r. Another MS is BM Arundel 229.

[34] I have also examined the undated incunabulum by "the R-printer" of Strasburg (BM. IB. 643) which gives a correcter text than the Geneva MS.

[35] Geneva 994, fols. 23v-27r, "Quomodo magice artes sunt inutiles."

[36] By the slip of the copyist our MS gives the impression that armomancy is divination performed in the stables of beasts rather than from their shoulder-blades: Geneva 994, fol. 23v, "aromancia cuius divinatio fieri solet in stabulis bestiarum. Nam armus stabula dicitur." The printed edition reads *scapulis* and *scapula*.

[37] *Idem*, "Verum quia talium artium amatores hec dicta voluntaria reputarent

little further and quotes prohibitions of them from the Bible. Such supporters of magic arts urge that it is no sin to speak with demons, since Christ did so. They also point to Joseph's auguries with his divining cup, but James holds, like Augustine, that Joseph only pretended to divine in order to frighten his brothers. James notes that Albertus in his book on minerals recounts many wonders wrought in German parts by means of characters impressed in precious stones. James admits the marvelous virtues of herbs and stones but denies those of characters. "What shall we say of the *ars notoria*"? James has seen two books on it, one ascribed to Ptolemy and opening, "I am alpha and omega . . ."; the other by John, the monk of Chartres, opening, "Ave gratia plena . . ." John repudiated the art of Ptolemy, but James finds John's own as bad and concludes that the *ars notoria* is closely related to magic and divination. It may employ prayers and fasting, but does it do so for a good purpose? James terminates his discussion by a few words on dreams, in which he adopts the usual attitude that medical interpretation of dreams is unobjectionable, that divine revelation in dreams is not vouchsafed to all, and that dreams by demon aid or suggestion are evil.

In the same year, 1405, that James the Augustinian was at Paris, was perhaps composed the *De superstitionibus* of Nikolaus Magni de Jawor—also spelled Jauer, Jawir, Gavir, Gawir, Gâwerder, and in yet other ways. Except on his title page, Franz usually calls him Nikolaus Jauer. This work had a wide circulation in manuscripts of the fifteenth century[38] and so seems

nisi ratio aliqualis ostenderetur, inquiramus. . . ."

[38] Adolf Franz, *Der Magister Nikolaus Magni de Jawor*, Freiburg im Breisgau, 1898, pp. 255-264, has listed 58 MSS, chiefly in German libraries, but does not include that which I have chiefly used: BM Harleian 3767, 1415 A.D., quarto, fols. 89v-124r, where it occurs in the midst of conciliar tracts; rubric, "Incipit registrum super libro de superstitionibus ab eximio magistro Nicolao magni de Gawir sacre theologie professori anno a nativitate salvatoris millesimo quadringentesimo quintodecimo edito secundum ordinem alphabeti." I reproduce this table of contents in Appendix 52. It will be seen that as a matter of fact it is not in alphabetical order. The incipit of the text is, "Quoniam lumbi mei impleti sunt illusionibus. . . ." The explicit in Har-

to have had a great immediate influence, although it was not subsequently printed. Nikolaus became a bachelor of arts at the university of Prag in 1378, and was promoted to the licentiate in 1381. He pursued the study of theology from 1381 to 1395, was *quotlibetarius* in 1394, and probably entered the theological faculty the next year. Meanwhile he had been preacher at the Galluskirche in Prag. In 1402 he went to the university of Heidelberg, where from 1407 to 1421 he was vice-chancellor. He attended the council of Basel but died in 1435.[39]

Franz is of the opinion that Jauer's book may have been written as a consequence of the condemnation on February 11, 1405, at Heidelberg of Werner von Freiburg, lector of an Augustinian convent at Laudenburg in the diocese of Speyer. He was forced to recant his tenets that God had created the world through angels as mediaries, that God had neither hands nor feet, that Adam had cleansed himself from original sin by standing for a long time in the river Jordan, that antichrist would be the offspring of a runaway monk and nun, that the cross of his convent was holier than all others, that the verses concerning the three Magi would heal the plague of St. Valentine, and that other such blessings or incantations work similar results.[40]

The work of Jauer is written from the theological standpoint

leian 3767, fol. 124r, ". . . et mala evadenda licet nobis tamen submissa semper prece divine voluntate etc. deo gratias," differs somewhat both in length and wording from that given by Franz (1898), p. 191. In many MSS the work is incorrectly attributed to other authors such as Henry of Hesse or Heinrich von Gorichem.

The date, 1415 A.D., of the Harleian MS, is perhaps an error for 1405, which is stated as the year of the work's composition in several of the MSS listed by Franz. But it may be noted that in another MS which he does not mention, the work is said to have been composed while Nicolaus was vice-chancellor at Heidelberg, an office which he did not yet hold in 1405: cod. Melk 94, Nicolai de Jawer de superstitionibus, "Editus a magistro Nicolao Gawir in studio Hayldburgensi pro tunc vicecancellario et doctore theologie. Anno domini 1448." Other MSS not included in Franz' list are: Monasterium Beatae Mariae Virginis ad Scotos Vindobonae, cod. 30, 15th century, fols. 331r-364r; Gissensis 791, 15th century, fols. 179-206; Gissensis 803, 15th century, fols. 160-185, where it is immediately followed at fols. 186-200r by the treatise of James of Clusa, the Carthusian, *De apparitionibus animarum separatarum.*

[39] For these events of Jauer's life see Franz (1898), p. 15 *et seq.*

[40] Franz (1898), pp. 151-153.

and censures popular and occult superstitions on the grounds that they imply disregard for God and pacts with demons rather than for reasons of scientific or rational scepticism.[41] First it discusses the powers and natures of demons, concerning whose existence it raises no doubt whatever. They are not animals of corporeal nature but immortal. They cannot generate their kind or increase their number or eat and drink.[42] But while they lack nutritive and augmentative virtue, they have motive and operative power.[43] They cannot read the inner thoughts of the human mind,[44] but they can divine present, past, and future better than man.[45] They can act on human appetite or affection[46] and by their fantasies and illusions of external sense they can influence human reason and intellect, and induce evil thoughts.[47] Such marvels of the demons as are not explicable as illusions of the senses or by their longer experience and intelligence, are accounted for by their power to move bodies from place to place.[48] It is thus that they feign sexual intercourse with men and generation. It is thus that such a feat as the apparent changing of the rods of the magicians of Pharaoh into snakes is explained. There was

[41] Franz, *op. cit.*, has devoted a chapter to it: XI, "Die Schrift 'De superstitionibus,'" pp. 151-196. J. Hansen, *Quellen und Untersuchungen zur Geschichte des Hexenwahns und der Hexenverfolgung im Mittelalter*, 1901, has printed some excerpts from it concerning demons at pp. 68-70.

[42] BM Harleian 3767, fol. 102v. It will be noted that I am not following Nikolaus's own order, since he does not introduce these observations as to the nature of demons until after he has discussed their powers for about one-third of his treatise. Such a writer as Witelo in the thirteenth century took a more material view of demons.

[43] Harleian 3767, fol. 103r.

[44] *Ibid.*, fol. 94r, "Correlarium secundum. Demon non potest inmediate et ex se occulta cordium sive cogitationes mentis humane cognoscere."

[45] *Ibid.*, fol. 100r, "Conclusio quarta: demones cognoscunt vel cognoscere possunt faciliter occulta tam presentia quam preterita ea que sunt ad extra in affectu que sunt vel fuerunt hominibus ignota et econtra."

[46] *Ibid.*, fol. 95v, "Quantum ad tertium non est dubium quin demon vel alius spiritus creatus possit agere in appetitum seu affectum sensitivum."

[47] See Conclusio prima (Franz (1898), p. 164, Harleian 3767, about fol. 92v) and Harl. 3767, fol. 94v, "Conclusio secunda mediante transmutatione fantasmatum potest demon vel alius spiritus creatus rationem seu intellectum hominis immutare."

[48] *Ibid.*, fol. 103v, "Conclusio secunda demones quamvis non possunt movere sive vas transmutare per se et inmediate ad formam naturalem possunt tamen corporalia transmutare potentia sua motiva et transportare ad loca diversa."

no true transmutation, but the rods were suddenly removed and the serpents introduced.[49] In all this Nikolaus is largely following past authorities from Augustine to Nicholas of Lyra, the fourteenth century commentator, but especially William of Auvergne and Thomas Aquinas.

Jauer further adopts the usual orthodox position that demons cannot be coerced by men as books of magic state, although he has some difficulty in explaining away such a passage as that in the sixth chapter of the *Book of Tobit* where the angel Raphael tells Tobias the younger that if a piece of the heart of a fish is placed on the coals, its smoke will drive out every kind of demon. He holds that smoke here refers to the power of prayer. Exorcisms should not be employed until they have been submitted to the bishop or trained theologians and canonists for approval.[50]

As for current superstitions Jauer deplores the fact that many people both laity and clergy, even including masters, bend the knee or bow the head at new moon or fast on that day, even though it be Sunday or Christmas when the church forbids fasting. He sees traces of idolatry in this.[51] Franz notes that Nikolaus von Dinkelspühel or Dinkelsbühl and Thomas of Haselbach later in the century allude to the same superstition.[52] Other superstitions attacked are that it is lucky to find certain things such as a nest of young birds or a needle or obol, or such observances as leaving the pots uncovered so that night demons may find food and drink, men and women wearing each other's clothing at Carnival, praying towards the north or west, kneeling before trees,[53] or writing the name of God on the wall as soon as one hears thunder in order that the house may not be struck by lightning.[54] Jauer adopts about the same position as Aquinas with reference to dreams, astrology, and lots,[55] and declares the *ars notoria* to be both inefficacious and illicit.[56] He

[49] *Ibid.*, fol. 104r.
[50] *Ibid.*, fols. 100v-101r.
[51] *Ibid.*, fol. 101r-v.
[52] Franz (1898), pp. 170-171.
[53] Harleian 3767, fols. 101v-102v. As to finding things, see also fol. 122v.
[54] *Ibid.*, fol. 121r.
[55] *Ibid.*, fols. 111r-114v.
[56] *Ibid.*, fol. 115r-v.

objects to the use of consecrated objects for medicinal or veterinary or agricultural purposes or against thunder storms. He argues that they were not consecrated for these purposes and if they have efficacy in these ways, derive it from demons. He repeats William of Auvergne's arguments against the power of words,[57] and those of Aquinas and others on the propriety of carrying written words as amulets, but adds a citation from the more recent commentator on the *Sentences,* Thomas of Strasburg. Even the incantation or charming of serpents he holds too often involves illicit observances and demon aid, one reason being that the serpent was the demon's first instrument in deceiving man.[58] But surely the demon would be crafty enough not to use the same artifice again. Indeed, Jauer is here guilty of the very sort of magic logic which he has opposed in contending that words and characters merely signify and have no operative power. So far as natural effects are concerned, it is licit to observe times on account of the influx of the heavenly stars and other agents, and so the dicta of the doctors should be interpreted. But one should not observe times superstitiously or ascribe necessity to the stars.[59] Belief in lucky days apart from astrology is censured.[60] In connection with his questioning the power of words, Jauer criticizes excessive faith in the saying of certain prayers or masses.[61]

[57] The discussion begins at fol. 117r. In this connection a passage distinguishing degrees of sanctity may be worth quoting: fol. 118r, "Res alique dicuntur sancte que continent in se formaliter sanctitatem et hoc dupliciter scilicet essentialiter ut deus vel participatione sive accidentaliter ut homo. Secundo instrumentaliter ut sacramenta et sacramentalia. Tertio significanter ut verba et imagines. Quarto approprianter ut sacerdotes ecclesie vestes sacre et alia huiusmodi que ad cultum divinum ordinantur. Quinto deputanter ut oblationes ecclesie ministris oblate. Quatuor modi ultimi sunt propter primum et secundum."
[58] Harleian 3767, fol. 120r.
[59] *Ibid.*, fol. 121r.
[60] *Ibid.*, fols. 121v-122r.
[61] Franz (1898), p. 187, has gone into this in more detail and given the Latin text. The tale of the revelation to St. Bernard by a demon of eight verses from the Psalter whose repetition have great saving virtue, which Franz takes from Vatic. Palat. 534, fol. 48v, I have seen also in some English MS, where we are told that when at first the demon would not tell Bernard which eight verses they were, the saint affirmed that he would repeat the whole Psalter every week and so be sure to include them. Then, "lest the saint do

It was also at Heidelberg in 1412, seven years after Jauer's treatise, that John of Frankfurt, bachelor of sacred theology, who further wrote against the Jews, Hussites, and holy Vehm, disputed the question whether demons can be coerced by characters, figures, and words.[62] His position is the usual one of Christian theologians. He in addition lamented the widespread existence of superstitious observances and relics of pagan idolatry among Christian people and the fact that they were too often encouraged by the clergy. He would like to see forbidden under penalty of death participation in the dancing choruses of St. John, St. Vitus, and Christopher.[63] He makes one interesting admission, that the demon, because of his knowledge of nature, is the best of physicians,[64] in addition to being a most subtle sophist and canny disputant.[65] Besides such stock authorities on his topic as Augustine, William of Paris, and Aquinas, he cites Henry of Hesse twice and Robert Holkot, the fourteenth century schoolman, several times.

Nicholas von Dinkelsbühl was an ecclesiastical writer who died in 1433 and whose writings are found with great frequency in manuscript collections in German libraries. In his work on

so much good" by repeating the entire Psalter, the demon revealed these particular verses to him.

[62] Franz (1898), p. 85, lists three MSS, Trier 60 and CLM 3417 and 15320, where our text occurs at fols. 150r, col. 2-155r, col. 2. There are two others at Bamberg 1908 (Q.V.3) and 1909 (Q.II.9), Questio utrum potestas coercendi demones possit fieri per verborum prolationem; and I presume that Schlestadt 82, 1478 A.D., Disputatio de quolibet studio Heydelbergensi, is the same work. Hansen, *Quellen,* 1901, pp. 71-82, printed the text from the Trier MS. The Munich catalogue of MSS, in describing CLM 15320 incorrectly says, "Iohannes de Frankford de superstitionibus (in disputatione Heydelbergae a. 1430)," since 1430 is the date of copying the text and not of the disputation, as the following closing sentences show: "Hec questio fuit in disputatione Heydelberge determinata anno domini M°CCCC°XII° nona die Ianuarii per me Ioh. de Frankford sacre theologie baccalaurium. Explicit deo gratias. Explicit hec questio per me Iodocum Haslath anno domini M°CCCC° trecessimo proxima feria secunda ante purificationem sancte Marie virginis."

[63] Franz (1898), p. 193, quoting Trier 60, fols. 49, 47v, 51v.

[64] Hansen, *Quellen,* p. 72; CLM 15320, fol. 150v, col. 2: "Ex quo sequitur quod demon est optimus medicus valde cognoscens rerum naturas scilicet (*sicut* in CLM 15320) herbarum lapidum et huiusmodi."

[65] CLM 15320, fols. 150v-151r, "Sequitur ulterius quod etiam demon subtilissimus est sophista calidissime sciens omnia fallaciarum genera et formare paralogismos apparentissimos et contra solutiones ipsorum coloratissime et efficatissime replicare (*et complicare* in MS)."

the precepts of the decalogue[66] he censures diabolical magic, use of incantations and divination, acceptance of chance occurrences as omens. For instance, if a person should sneeze while putting on his shoes, he ought to go back to bed. He also condemns the belief in lucky and unlucky times and in Egyptian days; the observance of beginnings such as the side of bed one gets out of, or the foot one moves first; and the treasuring as charms certain objects which one finds such as a bird's nest, a needle, or an obol. We have heard these very objects similarly mentioned by Nikolaus Jauer. Nicholas von Dinkelsbühl also alludes to the superstitious use made of the head of a dead dog or the corpse of a bird. His opposition to such practices is put on religious rather than rational grounds. They are all classed as sins.

James the Carthusian, or Jacobus de Clusa, or Jacob von Insterburg in Prussia, lived from 1381 to 1465. He was first a Cistercian monk in Poland, later a Carthusian near Erfurt. Two treatises by him are of interest to us, the one on ghosts, the other on demons. We shall consider first that on the power of demons, the magic art, and the superstitions and illusions of the same.[67]

James accepts the definition of an angel by Damascenus as an intellectual substance, ever mobile, of free will, incorporeal, serving God according to grace not nature, enjoying immortality, whose substance, species, and end only the Creator knows. Bad angels or demons are of a like nature. Augustine says that misty

[66] *De preceptis decalogi,* edited with other tracts of his by Wimpheling at Strasburg, 1516, fols. 27r-30r.

[67] BL Laud. Misc. 586, 15th century, membrane, double columns, Iacobi Carthusiensis Opera, fols. 112-133, Tractatus de potestate demonum, de arte magica, de superstitionibus et illusionibus eorundem. "Doctrinis variis et peregrinis nolite abduci . . . / . . . omnes ambulare possimus ad ipsum qui est via veritas et vita Jhesum Christum. Explicit tractatus contra vitam (*sic*) magicam." This is the MS which I have used: there are, of course, others such as Vienna 4225, 15th century, fols. 98-118; CLM 18378, 1470 A.D., fol. 245. The *De potestate demonum* is commonly accompanied in the MSS by James's other tract, *De apparitionibus spirituum,* of which we treat below, using the printed edition.

air is like a prison for them; Bonaventure, that they produce storms by descending with that heavy air, and that some saints have seen them in the air thicker than flies. Hence bells are rung in time of storms to frighten them away, and James knows of some bells which have been blessed, anointed, and consecrated by bishops and whose ringing is in consequence believed to be of greater efficacy. When demons possess men's bodies they are thought to haunt the humors especially. Such demons suffer hell fire as truly as their fellows in hell, but the person possessed does not feel it. James would not seem to have begun his treatise in a way likely to diminish popular superstition, but he remarks that natural philosophy and theology are needed to oppose trust in magic arts and demons, for when the causes of things are properly understood men cease to marvel at their effects. Rustics marvel, but not sages to whom causes are known. Because demons can transport bodies from place to place in a very short time—as in the case of the prophet Habbakuk or the evil spirit who, Albertus Magnus tells in *De coelo et mundo,* brought fresh leaves and fruit in winter time—men think that there is something divine involved, although it is done naturally by incantations and pacts of demons with false men.[68]

Presently James lays down a number of propositions as to the powers of demons.[69] The act of creation exceeds the faculty of either good or bad angels. So does the bringing anything into effective being by way of natural generation. But operations proceeding from art do not exceed their powers, nor does the formation of inanimate bodies. The operation of substantial form exceeds the faculty of all angels and belongs to God alone and to nature as instituted by God. Demons can assume bodies, but they are aerial and lack the usual organs and natural functions, and have no soul from which such operations might proceed. The demon is in the assumed body as a mover in a thing moved but not as form informing it. There is no blood in such a body and, if cut with a sword, it does not bleed. But the demons can

[68] Laud. Misc. 586, fol. 113v, col. 2.

[69] These begin, *ibid.*, fol. 117r, col. 1.

move the tongue and lips or make a sound by repercussion of air, as Balaam's ass seemed to speak or the serpent to converse with Eve.[70]

Just as the working of sensitive power in the assumed body exceeds the faculty of either a good or bad angel, so likewise the operation of natural vegetative power. But the illusion of both the inner and external senses does not exceed their power. "Whence Saint Thomas says that the whole machination of the devil seems to be about the phantasy and sensitive appetite."[71] The demons cannot alter the human will directly nor work true miracles. James's discussion of demons and their powers seems very similar and probably much indebted to the *De superstitionibus* of Nikolaus Jauer.[72]

James's propositions now shift from the powers of demons to the limits of human occult arts.[73] No creature has power to coerce or compel demons. To suspend divine words from the neck or carry them with one is sometimes licit, sometimes illicit. It may be possible by the aid of demons to alter the health or infirmity of men or animals but it is not permissible. The *ars notoria* for acquiring science from demons is to be rejected absolutely. Words employed to cure diseases or wounds or to bless animals to preserve them from wolves or worms or to extract weapons from wounds are inefficacious and vain unless by prayer or invocation of God. The same is true of herbs and stones, since they do not have virtue in themselves for such effects, "unless perchance from natural virtue, since we do not read of its being done by the saints."[74] But the exception of natural virtue is important.

Most divination is evil,[75] but prognostication of future effects from the stars is licit in so far as they incline men by impressing the body—for which the authority of Aquinas is invoked.[76] James the Carthusian agrees with James the Augustinian and

[70] Laud. Misc. 586, fol. 118v, col. 1.

[71] Had Aquinas only limited himself to that statement he would have done well, but unfortunately he went further.

[72] See above, pp. 280-283.

[73] Laud. Misc. 586 beginning fol. 121v, col. 2.

[74] *Ibid.*, fol. 124r, col. 2-124v, col. 1.

[75] *Ibid.*, fol. 125v, col. 1, "Divinatio ut communiter in malo accipitur semper est peccatum mortale."

[76] *Ibid.*, fol. 126v, cols. 1-2.

Dionysius the Carthusian, although he cites neither, that Joseph's remark to his brothers, "Or are ye ignorant that I possess a like science of augury?" is not to be taken seriously.[77] We may pass over James's treatment of dreams and lots which is duplicated by others whom we consider, and his recounting from such earlier writers as Augustine and William of Paris stories of demons and natural things to expel them. His final conclusion is that the magic art is not a true art but a diabolical deception because it does not use true principles but herbs, stones, and signs which have no efficacy towards such effects. He wishes that men in various localities would inform the clergy as to the prevalence of such forbidden arts.

The other treatise by James on the apparitions of souls after their departure from the body and on their receptacles[78] is in large measure made by him an excuse for urging the living to contribute to the saying of masses or to indulgences in order to hasten the release of such souls from purgatory or to lessen their sufferings there,[79] and further for urging the living to penitence in order to escape a like or worse fate.[80] James accepts the quantitative viewpoint in such matters to the extent of asserting that prayers offered in a cemetery where only a few persons are buried will do each of them more good than if said at a much larger burial-ground where many are interred.[81] Such moralizing[82] and religious beliefs are hardly germane to our investigation, and we may omit James's tales of purgatory[83] and other stories from such works as the *Dialogues* of Gregory the Great, merely noting in passing his belief in the presence of demons at death-beds[84] and in four places for souls after death —the empyrean heaven, hell, limbo, and purgatory.[85]

[77] *Ibid.*, fol. 127v, col. 2.

[78] *Tractatus de apparitionibus animarum post exitum earum a corporibus et de earundem receptaculis, editus in erdfordia ab excellentissimo viro Jacobo de Clusa ordinis cartusiensis sacre pagine professore doctissimo,* Burgdorf, 1475. The work opens at fol. 1r, "Rogamus vos ne terreamini per spiritum . . ." and closes at fol. 25v, ". . . veniam petens de prolixitate aut superfluitate caritate ad hoc me instigante. Pro quo deus sit benedictus in secula. Amen." On fol. 26r we read, "Explicit tractatus eximii doctoris Iacobi de clusa ordinis cartusiensis de apparitionibus et receptaculis animarum exutarum impressus in opido Burgdorf Anno domini millesimo quadringentesimo septuagesimo quinto." The leaves were originally unnumbered but had been numbered in pencil in the copy which I used at the New York Public Library. Other editions are numerous.

[79] *Ibid.*, fol. 16v, "Sequitur de octavo scilicet de suffragiis quibus animabus (*sic*) exutis potest subveniri per viventes."

[80] *Ibid.*, fol. 20v, "Sequitur ergo modus quomodo viventes possunt evadere penas futuras."

[81] *Ibid.*, fol. 18r.

[82] The work closes (fol. 23r) with an "Exclamation of the author" over the sinfulness of the present age.

But James mingles a certain amount of natural hypothesis and philosophy with his belief in ghosts, and this combination is of some interest. In the first place he accepts without scepticism as a fact that recently apparitions of spirits have been making disturbances in monasteries, cemeteries, churches, and houses, throwing stones about, overturning tables, and so on. Sometimes this has gone so far that the inhabitants have been compelled to flee from their dwellings. Indeed, James professes to have had personal experience thereof. Prayers and ceremonies were unavailing to check the disturbance.[86] James, however, believes that such phenomena are of much more frequent occurrence among Christians than infidels, the reason being that they are meant as an appeal or warning to the living.[87]

James holds that the separation of the human soul from the body is always painful, even when death comes during sleep or seems to be peaceful. The soul recedes from the body because of its intemperate state and the breaking up of its qualities and humors. The vital spirits through which the soul operates become gross and deficient in the body, and the instrumental powers of the vegetative and sensitive soul become unworkable, in consequence of which even acts of the intellect become impossible.[88] It is like a harp with broken strings. The soul is conserved in the body by a harmony of qualities proportioned to human operations, and when these are destroyed, the soul withdraws. The heart is the last part of the body to die,[89] and hence the external members may not show the pain of mortal agony which occurs internally. Only a few saintly persons like the

[83] *Ibid.*, fols. 7v-8r.

[84] *Ibid.*, fol. 3v.

[85] *Ibid.*, fol. 5r.

[86] *Ibid.*, fol. 1r.

[87] *Ibid.*, fol. 1v.

[88] *Ibid.*, fol. 2r.

[89] *Ibid.*, fol. 2v.

Virgin and apostle John were privileged to die a truly painless death.

James thinks that no fixed rule can be given as to places where ghosts are wont to appear to the living.[90] The reason why such apparitions terrify is the lack of proportion between the soul living in the body and the soul when disembodied.[91] When souls are freed from their bodies they yearn the more to see God and suffer the more if they don't. This James illustrates from natural philosophy which teaches us that natural motion, as of a falling body, is slow or remiss at the start but accelerated or more intense at the end from natural desire to attain the *terminus ad quem* in which it will be at rest. It also follows the shortest line to its natural place.[92]

What had been announced in James's introduction as the fourth, fifth, and sixth chapters on inquisitors or experimenters of these souls and how they should be disposed, on the ceremonies to be employed, and the questions to be put to the ghosts, is treated together in the text.[93] He would let three days of praying and fasting precede. Then clergy should visit the haunted places with a candle lighted on the day of the feast of purification, holy water, the sign of the cross, and incense. Repeating the seven Psalms or Gospel of John, they should enter the place sprinkling and censing. A form of prayer for them to use is given. The spirit should be asked who he is, to whom he wishes to speak, what masses he wants said or what alms performed on his behalf. James also has a seventh chapter on ways to distinguish good from bad spirits, towards the close of which he touches on different possible sources of dreams.

This treatise of Jacobus de Clusa, like the other, seems, despite its smattering of natural philosophy and current theories of proportion, intension and remission, much more likely to

[90] *Ibid.*, fol. 10r.
[91] *Ibid.*, fol. 10v.
[92] *Ibid.*, fol. 11r.
[93] *Ibid.*, fol. 11v, "Sequitur de quarto V et VI scilicet de inquisitoribus seu experimentatoribus harum animarum et quomodo expediat eos esse dispositos. Et de ceremoniis precedentibus ad istam expergentiam. Et de interrogationibus ab animabus faciendis."

spread than to allay superstition and credulity. That it was very popular in Germany is indicated by the number of editions there before 1500.

Among the group of German scholars and clergymen who wrote against superstition in the fifteenth century was Leuwis de Rickel or Dionysius the Carthusian (1402-1471). His *Contra vitia superstitionum* was in seventeen short articles or chapters and was probably written about the middle of the century or a little thereafter.[94] He intends to discuss the matter briefly, plainly, and simply.

In the first chapter Dionysius defines superstition as excess of religion or *latria* and distinguishes three varieties of it: idolatry, divination, and manifold illicit observances. Superstitious divination, we are told in the second chapter, is the attempt to predict purely contingent events, foreknowledge of which is God's province. God knows future things in themselves, men may know them to some extent from their causes, either with certainty as when astronomers predict an eclipse, or probably as when they predict rain or drought.

Several successive chapters[95] are then devoted to the use of words, benedictions, adjurations, and invocations in curing wounds or diseases or expelling serpents or collecting herbs. Such authorities are cited as Augustine and Chrysostom, Aquinas and the *Decretum,* William of Paris and later works like

[94] I have used an edition of 1533 in which it occupies pp. 598-628, opening, "Dominum deum tuum timebis et ipsi soli servies. . . ." In the same edition *D. Dionysii Carthusiani Epistola ad principes catholicos paraenetice qua per scripturas et tres revelationes sibi divinitus factas in tempora haec nostra respicientes ad generale celebrandum concilium et bellum adversus Turcam suscipiendum hortatur,* which precedes our treatise at pp. 555-597, is dated 1461, but our treatise seems to be undated.
[95] Art. III, "De superstitionibus observationum in verbis"; IV, "Obiectio contra predicta et eius solutio"; V, "Declaratio plenior predictorum et de multiplici superstitione abusione atque errore multorum circa benedictiones adiurationes seu invocationes pretactas et etiam circa ligaturas ac deportationes verborum sacrorum ad collum circa alias quoque credulitates quasdam inanes"; VI, "Quod finaliter videatur esse consultum circa benedictiones invocationes seu adiurationes praefatas"; VII, "Solutio questionis que oritur ex predictis videlicet unde prefate benedictiones adiurationes seu innovationes (*sic*) sortiant effectum etiam tunc quando inordinate fiunt."

the *Summa* of Raymond, *Summa confessionum* of Iohannes, and *Summa Pisana* of Bartholomaeus. It is stated on the authority of Aquinas and the *Decretum* that such usages are permissible, if only divine words are employed without any intermixture of unknown names or falsity, and with use of no characters save the sign of the cross, with due reverence to God and with expectation of results from Him alone. Such incantations and the suspension of such written words about the neck are not superstitious but licit in themselves. But it is wrong to believe that such words and suspensions have a certain and invariable action comparable to the words of the sacraments. Often they do not work. Moreover, the danger of going astray in employing them is so great that Dionysius thinks that priests had better prohibit them to the laity, especially the uneducated, or at least instruct them very carefully concerning them. Even when performed in an inordinate and illicit manner, they are often found to be effective, but this is because in such instances demons add their unholy assistance. Nevertheless some men persist in such illicit observances simply because they find them effective, which grieves Dionysius the Carthusian much.[96] In this connection he makes the statement which we meet also in a work by the fifteenth century Italian inquisitor, Francis of Florence, namely, that they ought to allow all their cattle to die rather than to do anything illicit for their preservation.

In the ninth chapter Dionysius alludes to a treatise on superstitions whose author had drawn largely from the *De fide et legibus* of William of Paris. This unnamed author, possibly Nikolaus Jauer,[97] objected to combining sacred things with natural things or using holy objects for any other purpose than that which they fill in the ecclesiastical service. Dionysius, however, feels that this censure is too sweeping. Holy water is ordained for the repression and expulsion of demons, but demons are frequently intermingled with storms, and therefore the use of

[96] Art. VIII, "Quam intimorati ac vitiosi sint homines multi."

[97] Such is the opinion of Adolf Franz, *Der Magister Nikolaus Magni de Jawor,* 1898, p. 195.

holy water against storms is not superstitious but virtuous and laudable. Or if other consecrated things are used to honor God, albeit not directly for the purpose for which they were consecrated, Dionysius feels that this is not illicit. The unnamed master cited, however, classes as superstitious the weighing of a man against an equal weight of barley as a cure for epilepsy, the showing of holy water to the domestic animals to protect them from wolves, and the notion that words of the Gospels vary in efficacy according as they are written down while the Gospel is being read in church.

In the next few chapters Dionysius returns to the subject of divination. He holds that divination by invocation of demons is wholly illicit, but he grants that most men follow the inclination of the stars although they might resist. Therefore to a certain extent divination by the stars is allowable, although they do not dominate the will or intellect or accidental occurrences. Alkindi, Albumasar, Avicenna, and Algazel make excessive claims for them and have been refuted by William of Paris, Egidius Romanus, and Aquinas. As for dreams, physicians assert their value as indicating internal dispositions of body and soul. And sometimes the imagination of the sleeper is affected by the surrounding air or by an impression from the heavenly bodies. Albertus and Aquinas say that the human soul in sleep is apt to receive angelic revelations and divine information. But some dreams are from demons, and divination from these is illicit. One should not put too ready trust in dreams, because they are affected by one's previous thoughts and occupations and furthermore may be diabolical illusions. As for augury, such phenomena as the utterances and movements of birds cannot be the causes of future events, although brute animals by their sensitiveness to nature about them may give signs of certain future events. But this holds true only of natural happenings, not acts of volition and intellect. Lot casting is treated much as in the tract of Aquinas on that subject, and the *ars notoria* for acquiring knowledge without study is condemned.[98] Lucky and unlucky days

[98] Articles xiv and xv.

have no sound natural or astrological basis, and chiromancy Dionysius is inclined to regard as from the devil. The practice of making gifts on New Year's day is superstitious, if it implies that this day has any special virtue above others; but is permissible, if the object is merely to renew friendships or some other rational aim.

Contra vitia superstitionum is even more than we have indicated a compilation from previous authorities such as Augustine and the *Decretum*. Yet it is said that one of its author's principal occupations during the trip through Germany which he took with Nicholas of Cusa as papal legate was the investigation of the magical and superstitious practices in vogue there, and that he was entrusted with the conversion and guidance of a celebrated magician.[99] But the chief significance of his treatise is in showing the perennial interest that the topics and problems of which it treats had for that period.

Schönbach has published[100] some excerpts from the writings of Thomas Ebendorfer of Haselbach (1387-1464) which may serve to illustrate his attitude to popular and other superstition. In part like other fifteenth century writers he simply repeats what William Auvergne, bishop of Paris, had already said in the thirteenth century: concerning those, for example, who burn incense to Jupiter and Saturn on Thursday and Saturday evenings, or those who offer their sons' clothing to trees.[101] Thomas objects not only to those who worship creatures instead of Creator but also to those who worship God in an unseemly manner by idle and stupid observances, such as erecting crosses on hills and mountains to keep off storms, praying to be free from fever or toothache or headache so many Pater-nosters before sunrise or on three Fridays, or threatening the herds with rods cut on certain days to protect them from wolves, or using a

[99] D. A. Mougel, *Denys le chartreux (1402-1471): sa vie, son rôle, une nouvelle édition de ses ouvrages*, 1896, pp. 43, 58.

[100] *Zeitschrift des Vereins für Volkskunde*, XII (1902), 1-14. See also Adolf Franz, *Die kirchlichen Benediktionen im Mittelalter*, 1909, I, 205, 457, 469; II, 14, 109-116, 433.

[101] *Zeitschrift des Vereins für Volkskunde*, XII (1902), p. 6.

rod which is just one's height. "And in general if hope is placed in the method of praying or writing or binding or carrying or any other vanity which does not conduce to divine reverence."[102] Thomas objects to employment of unknown words or characters on swords or in divination or in the *ars notoria* to acquire knowledge quickly by prayers.[103] When idolatry was overthrown the devil substituted the more insidious use of characters.[104] Haselbach also censures such methods of foretelling one's future husband or wife as sleeping with a certain object under the pillow or drawing straws on Christmas.[105] The execration used to cure toothaches that Christ entered a field and found three worms, one black, one white, and one red, and killed them, cannot be uttered without sin because it contains a falsehood. Others affirm that Saint Peter had a toothache and Christ bade him throw water in his mouth and have faith in it and he was cured, which in like manner is suspect of falsity.[106] Such are the glimpses of popular superstition in the fifteenth century afforded by Thomas of Haselbach.

Marianus Socinus or Sozinus or Sozzini of Siena (1401-1467) was a disciple of the noted canonist, Nicolaus de Tudeschis, commonly known as Panormitanus, and himself became professor of canon law at Padua and Siena.[107] Later members of the family, Lelio Sozzini, born in 1525, and his nephew Fausto born in 1539, both likewise lawyers, were to develop Anti-Trinitarianism or Socinianism or the Unitarian faith. Marianus was a friend of Aeneas Sylvius and, when he sent that humanist his commentaries on the *Decretals*, the future Pius II replied that they were too long for him to follow and that he would prefer to see Socinus's work on *Sortes* or lot-casting.[108] Something akin to shaking dice seems to have appealed to the volatile and practical Piccolomini

[102] *Ibid.*, p. 7.

[103] *Ibid.*, p. 8. Schönbach (see *idem*, note 71) was puzzled by the word *notoria*, but it is of course a well known occult art.

[104] *Ibid.*, p. 10.

[105] *Ibid.*, pp. 8-9.

[106] *Ibid.*, pp. 11-12.

[107] J. F. v. Schulte, *Die Geschichte der Quellen und Literatur des canonischen Rechts von Gratian bis auf die Gegenwart*, Stuttgart, 1877, II, 319: cited by Hansen, *Quellen*, p. 212.

[108] R. Wolkan, *Der Briefwechsel des Eneas Silvius Piccolomini*, in *Fontes rerum Austriacarum*, vol. 61, p. 239.

more than poring over the dry wording and involved logic of a technical legal discussion.

It is this *De sortibus* that we propose to consider here.[109] The treatise was addressed to cardinal Bessarion.[110] It proceeds to a considerable extent along similar lines to the opusculum of Thomas Aquinas on the same subject. After a few chapters it widens its scope to all sorts of occult, divining, and magic arts, but here too largely depends upon a previous guide, Isidore of Seville. Socinus also occasionally quotes the more recent jurist, Raymond de Archidiaconis of Cremona who in part at least followed Aquinas's views.[111] Other popular superstitions than lots receive some attention. In the main the treatise seems a clumsy compilation from previous authorities, including the Bible and *The City of God,* but a few illustrative passages may be noticed.

Socinus appears to prefer Augustine's statement in his commentary on the Psalms that "A lot is not anything evil but something to determine God's will when man is in doubt,"[112] to pope Leo IV's assertion that "A lot is nothing less than divination and sorcery condemned by the saints and Fathers," or Isidore's definition, a "science of divination of the future by pretended religion." He compromises, however, on Aquinas's definition that, "A lot is inquisition of what is hidden beyond human industry" (or, judgment).[113] Vaticination may be by mental fury or alienation, which Socinus identifies with diabolical instigation, or by divine inspiration, in which case it is prophecy. In any case it comes on, "not by inquisition but by fortune" and so is not lots or *sors.*[114] Although living on the verge of the witchcraft delusion, Socinus agrees with the *Canon episcopi* and early medieval writers that those women who think they ride by night with Diana and carry the multitude with them in their delusion are merely deluded in phantasy by Satan.[115]

Astrology is distinguished from invocation of demons,[116] but limits are set beyond which its theory and practice are considered illicit. Those who believe that everything is subject to the stars arouse much righteous indignation in Socinus.[117] He would prohibit consultation of an astrologer whether this chattel should be yours or mine, contending that "the virtue of astronomy does not pertain to this."[118] Yet it is lawful to investigate the future by the science of astronomy in so far as belongs to that science according to natural reason. The great authority in canon law of the early fourteenth century, Giovanni Andrea, had given it his approval.[119]

Returning to lots for a moment Socinus censures the duel or wager of battle as a method of proof, since it depends on bodily strength or agility and is no measure of justice.[120] The prohibition of lots in ecclesiastical elections, where the holy spirit guides, does not, he holds, extend to secular elections such as are determined by lot at Siena and Florence. He further discusses how far a judge may resort to lots to settle a discord between the parties to a suit, especially heirs.[121]

Turning to popular observances and superstitions, Socinus thinks that suspending a scroll or nut from the neck on St. Christopher's day in order to escape disease "seems to pertain to

[109] The text which I have used is Vatican Reg. Suev. 1272, fols. 1r-37r, where our treatise is the only one in the manuscript. Hansen, *Quellen und Untersuchungen,* pp. 212-215, has printed the table of contents, chapter 8, and part of chapter 9, which is the last. He used a different MS, however, Rome, Angelica 90, fols. 31-47, which he describes as contemporary, "aber flüchtige und fehlerhafte."

[110] Reg. Suev. 1272, fol. 1r, "Reverendissimo in christo patri et domino domino b. cardinali Niceno vulgariter nuncupato Marianus Sozinus Senensis se plurimum commendat." The preface then opens, "Cum (*Quum* in the Angelica MS) superioribus diebus R. d. tuam visitassem tanta cum benignitate atque humanitate subceptus fui. . . ." At fol. 37r the text ends, ". . . clericus laycum de foro conpeten. Hoc est quantum de sortibus Reverendissime Bysaryon mihi Mariano Sozino Senensi litteris mandare visum fuit. Tu vale et emenda et me commendatum habe. Laus deo omnipotenti. Amen."

[111] *Ibid.,* fol. 24r, ". . . beatum Thomam quem sequitur Archid. XXVI q. 11. c. Sors."

[112] *Ibid.,* fol. 1v.

[113] *Ibid.,* fol. 2r.

[114] *Ibid.,* cap. 4, fols. 4v-5.

[115] *Ibid.,* fol. 10r.

[116] *Ibid.,* fol. 13r.

[117] *Ibid.,* fol. 16r.

[118] *Ibid.,* fol. 23v.

[119] *Ibid.,* fol. 32v.

[120] *Ibid.,* fol. 23v, "nec licitum est per duellum querere quis ex duobus duellantibus iustitiam foveat quum illud potius ad corporis fortitudinem et membrorum agilitatem quam ad rerum divisionem pertinet."

[121] *Ibid.,* fol. 24r.

idle superstition."[122] But he deems it proper to ring the bells against hail storms or the pest, citing two previous canonists in support, and he quotes Aquinas that it is permissible to wear a verse from the Gospel around the neck against fever.[123] But to put a key, sword, or other object of iron or steel between the teeth at the moment when the bells are first heard on the Saturday of passion week seems to him superstitious[124]—in which he is in accord with Franciscus Florentinus.[125] He does not object to the wearing of gems, since they possess great occult virtues,[126] and he also approves of the yule log festivities at Siena.[127]

William de Bechis or Becchius of Florence began his studies at the Augustinian convent in Padua in 1433, was made general of that order in 1460, and bishop of Fiesole in 1470. From this position he resigned in 1481, dying later in extreme old age.[128] He wrote commentaries on the *Ethics, Economics,* and *Politics* of Aristotle, and a work against Mohammedanism which was printed in 1471. Of his discussion of comets addressed to Piero de' Medici we shall speak in a subsequent chapter. For the present we are concerned with his treatise on the power of spirits, which appears to have remained in manuscript.[129] He was induced to write it by the extreme prevalence of superstitious practices in the part of France where he then was.[130] Some, he says, use scrolls, some incantations of almost infinite variety, some lots, some auguries and divinations. Many follow the judgments of astrologers. Others use characters, figures, mirrors, rings, images. Some invoke demons, some have familiar spirits,

[122] *Ibid.*, fol. 28v.
[123] *Ibid.*, fol. 29v.
[124] *Ibid.*, fol. 30r.
[125] See the next chapter.
[126] Vatic. Reg. Suev. 1272, fol. 30v.
[127] *Ibid.*, fol. 31r.
[128] Gandolfo, *Diss. hist. de ducentis celeberrimis Augustinianis scriptoribus,* 1704, p. 147. Valentinelli, in describing MS Venice, S. Marco V, 6, puts William's death in 1496. Lami (1756), p. 64, printed from MS Riccard. M. II. XXI the brief dedicatory letter of magister Guillelmus Bechi, Expositio Isagoges Porphyrii et Categoriarum Aristotelis ad Andream Alamannum.
[129] Vatican 4593, fols. 1r-44, "De potestate spirituum per magistrum Gulielmum de Bechis Generalem ordinis beati Augustini." Incipit, "Hora est iam nos de somno surgere. . . ."
[130] *Ibid.*, fol. 1v, "Et quamvis haec pestis longe lateque Christianos occupaverit has tamen Galliae partes ubi modo sumus ita inferit ut huius morbi cura minime sit amplius differenda. . . ."

some observe dreams. Some say they consort with demons and traverse great distances at night and pass through closed doors and have sexual commerce with demons, sacrifice children and insult the Host, send diseases and storms to afflict mankind, transform themselves into animals. These features of the witchcraft delusion William flatly opposes, maintaining the position of the *Canon episcopi* that they are dreams or imaginations. Spirits are incorporeal. They can to some extent assume bodies but not true animated ones. The bodies so assumed are not made entirely of air, William thinks, or their colors and solid appearance could not be accounted for. Just enough of the other elements are added to make possible such illusions, but the bodies assumed are not complete mixtures of the elements, and spirits cannot assume a true human form or *complexio.* They cannot exercise the functions of the vegetative soul and only the motor activities of the sensitive soul. They can, however, make a pretense of generation—the usual explanation—and they can deceive human sense in various ways. But they cannot force evil thoughts or actually transmute objects or make solid bodies pass through walls or closed doors, though their tenuous assumed bodies they can cause to do so. Wherefore all those imaginary apparitions and games, banquets, and choruses, long journeys too and songs, are false. Such is William's treatise, in the main a straightforward argument unmarred by inconsistent concessions, or by credulous anecdotes. Unfortunately his method of curing superstition was not the one that was to find more favor.

From this glimpse by a Florentine of conditions in France in the middle of the fifteenth century we may turn to the work of Petrus Mamoris, a native of Limoges, a canon of Saintes, and professor of theology at the university of Poitiers. His work, called in the printed editions *The Scourge of Sorcerers,*[131] was written at

[131] There is an incunabulum of Paris, 1490, *Flagellum maleficorum editum per eximium sacre theologie professorem magistrum Petrum Mamoris natione Lemovicensem canonicum ecclesie beati Petri Xantonen(sis) alme universitatis Pictaviensis regentem egregium incipit feliciter.* In this edition Peter's treatise is followed by a *Tractatus de superstitiosis quibusdam casibus completus in alma universitate Coloniensi* by Henricus de Gorchen.

the request of the bishop of Saintes, Louis de Rochechouart.[132] In a manuscript copy of *The Scourge* which I have used[133] it is followed by an account of this bishop's trip to the Holy Land in 1461.[134]

At the close of *The Scourge* it is stated by John de Champgillon, a priest who copied it in September, 1483, that it was added to by its author in 1462.[135] We therefore infer that it was originally written before that date. There is also internal evidence of a revision or additions.

There are indeed strange repetitions as well as additions. Thus we are told early in the treatise that some persons carry with them the hand of a corpse to which the sacraments have been applied and with which they make the sign of the cross in reversed fashion over some sleeper, causing him to sleep for a whole day without waking so that they may rob his house at leisure.[136] Later on Peter states that a man told him that he had seen a woman burned at the stake with the hand of a corpse about her neck with which she had kept men asleep by making the sign of the cross backward.[137] Right after the first mention of this gruesome practice Peter spoke of those who sell winds in pill-boxes for use at sea,[138] and following its second occurrence he states that friar Petrus Berchorius in the book *De mirabilibus mundi* says that certain

The *Flagellum* was also printed in the later editions of the *Malleus maleficarum*. Hansen, *Quellen*, pp. 208-212, prints extracts.

[132] According to Eubel's *Hierarchia* he became bishop of Saintes in 1462 and died in 1493.

[133] BN nouv. acq. 497, fols. 1r-30r. The text opens abruptly in the middle of a sentence, and a marginal note calls attention to the fact that its beginning corresponds to the twenty-sixth line on the fourth page of the incunabulum.

[134] *Ibid.*, fol. 31v *et seq.* Between the two treatises, at fols. 30v-31r, intervene some notes on cures and diseases, an epidemic of pleurisy in France and Italy in 1462, the need of bishops giving their people more attention, and disasters of the ninth century—Danish devastations, a comet, and famine. It hardly seems that these can be the additions which Petrus Mamoris is said to have made to the *Flagellum* in 1462.

[135] *Ibid.*, fol. 30r, "Iste tractatus a primo conditore sui complementum accipit anno domini M° quadringentissimo sexagesimo secundo scriptus autem hic per me Io. de Champgillon presbiterum anno domini M°CCCC° lxxxiii° in mense septembris circa finem. Laus deo. Champgillon." This colophon also occurs in the incunabulum, at fol. ε ii verso.

[136] BN nouv. acq. 497, fol. 2r.

[137] *Ibid.*, fol. 18r.

[138] BN nouv. acq. 497, fol. 2r.

persons sell the wind to sailors in a pill-box.[139] Or a little more than half-way through the work the author declares it an error to think that demons can be compelled by the natural powers of stones, herbs, characters, and words. Yet to punish the pride of the fallen angels, they were put under inferiors in some cases, as William of Auvergne says, and so they are put to flight by certain herbs and stones.[140] Some pages further on we are again informed that it is proper that the fallen angels be submitted to some inferior objects.[141]

These repetitions strike one as odd, but still stranger are the contradictory and opposite attitudes expressed as to the tales or confessions of witches and their sabbats. In one passage judges are warned to make sure that all this is not a delusion or pretense, since often the accused think that they have done things which they have not. Doctors in theology should be called in, and physicians to inspect their state of health and judge their dreams and determine if the brain is affected or if medicine will help them. Their confessors should persuade them not to believe in such apparitions and exorcize and pray for them. Husbands and wives often only pretend to be bewitched, preferring intercourse with another. Peter thinks that attendance at sabbats and what is supposed to go on there is largely or most often a delusion, worked it is true by the demon. Even though they confess to it, it is a delusion, and multitudinous confessions of this sort only prove that the number of fools is infinite. Even if they say they saw one another there, this may be a simultaneous delusion effected by the demons. As for the injuries and crimes which they boast to have committed during the night, these diseases of infants or thunder storms are really due to natural causes but are presented by the demon to their deluded fancy as their own work. Only if these persons can be proved to have employed magic paraphernalia such as powders, nails, and frogs, would Peter have the legal penalty for sorcery exacted.[142] All this seems admirable and suited to nip the witchcraft delusion in the bud.

[139] *Ibid.*, fol. 18v.

[140] *Ibid.*, fol. 16r.

[141] *Ibid.*, fol. 25r.

[142] BN nouv. acq. 497, fols. 14r-15v.

Unfortunately it is not all. Suddenly Peter turns about and declares for the reality of sabbats. "From these and many other things," he says, although in the meantime he has simply been denying virtue to figures, seals, and images, and advancing no arguments for the sabbat's reality, "it is to be held for certain that some are carried by night or day by the demon to places remote and near," and there form choruses, adore the demon, hold sexual intercourse, and bring death and sickness to other persons.[143] Later he argues for the death penalty for sorcerers and lot-casters,[144] and tries to explain away the *Canon episcopi*,[145] which, he had stated earlier, was cited by many disbelievers in magic.[146]

From such seeming inconsistency and from the repetitions characteristic of parts of the treatise one is led to think, not merely that Peter or someone else made later additions to its original form, but that it may be a collection of extracts from different authors without much regard to unity, order, or consistency. There runs through it however, the unifying thread of personal recollections and stories of Poitiers.

In some respects the *Flagellum maleficiorum* is much like the treatises of James the Carthusian and Dionysius the Carthusian. But to its discussion of the powers of demons and sorcerers and its citations of the familiar past authorities it adds recent incidents or reported incidents in the vicinity of Saintes or Poitiers which show how widespread and deep-seated were superstition and credulity. Before we come to such detailed incidents we may note the most interesting passage in Peter's work, that at the beginning in which he ascribes the recent outburst in France of the magic arts and ancient superstitions of the Gentiles to the devastation and depopulation and inroads of foreign mercenaries in the Hundred Years war, in consequence of which unknown tongues and foreign customs spread through the land and evils long before unheard of by Christians.

Peter was told by a certain Lambert, a master of arts and bachelor of theology, and a man of great integrity and science, that in a certain abbey of the diocese of Saintes the monks were greatly annoyed by the chatter of the jackdaws, until a Spanish sailor drove a nail into a tree and frightened them away. When a year had elapsed the Spaniard reappeared and asked if any daws had been seen there since. When he heard that there had not been, he drew out the nail, and without delay the birds returned and made as much noise as before.[147] In 1447 at Poitiers in the parish of St. Paul a spirit threw stones and utensils about the house and broke the glass windows.[148] Or Peter tells of a case of impotency induced by the devil which he saw at Poitiers during the episcopate of Jacques Juvenal[149] (1449-1457). Or of a devout woman of Poitiers whose dream on three several occasions that her teeth were falling out of her mouth was followed in every case by the death of a relation.[150] Or of a magpie near Bourges whose strange behavior gave warning of the coming of men-at-arms. Whether this was the work of a good or evil spirit Peter leaves for the present to the judgment of the learned, "but I truthfully tell what I saw."[151] Peter knew a learned man at Poitiers who had such startling success with the art of geomancy that he dropped it for fear of some evil hidden influence.[152] William de Luxe was a Benedictine monk, a master in theology, and great preacher, more however for words than science, whom Peter often met and talked with at Poitiers. He became a member of the faculty of theology there but was accused of sorcery and convicted. On December 12, 1453, in the chapel of the bishop of Evreux before his judges he confessed that he with accomplices had many times attended nocturnal worship of the demon, who sometimes appeared in the form of a man and sometimes as a goat, and that he had at the demon's suggestion foresworn Christ, the virgin Mary, the holy cross, and articles of faith. Grovelling on the ground and begging mercy he showed his judges a scroll in which the demon instructed him to preach to the people that this sort of sect was

[143] BN nouv. acq. 497, fols. 16v-17r.
[144] *Ibid.*, fols. 27r-28r.
[145] *Ibid.*, fol. 29v.
[146] *Ibid.*, fol. 2r.
[147] BN nouv. acq. 497, fol. 1v.
[148] *Ibid.*, fol. 6r.
[149] *Ibid.*, fol. 11v.
[150] *Ibid.*, fol. 26r.
[151] *Ibid.*, fol. 22r.
[152] BN nouv. acq. 497, fol. 16v.

nothing but illusion of fancy. And by this preaching that nefarious sect was increased and sorcerers emboldened and ecclesiastical judges rendered more remiss in investigating cases of sorcery. So master William de Luxe was condemned to perpetual imprisonment and soon after died in prison.[153] Possibly his sad fate had some effect in altering Peter's own earlier attitude.

Peter's conception of the extent of the powers of demons[154] is similar to that of our preceding authors. They cannot form new species in phantasy or in intellect, but they can affect the blood and humors and move bodies proportioned to themselves. That is to say, a greater devil of a superior order can move larger bodies than a minor demon and can bind his inferior in a stone or ring or other body. But he cannot move the sky or any element as a whole because that would destroy the order of the universe. He cannot move matter to take on form but he can make a composite from matter and form. It is argued that demons, as separate substances, are outside the process of nature and lack local motion, but Peter holds that they can apply natural agents through local motion to produce certain effects. And natural causes when dominated by a spiritual substance act more strongly than they do in the ordinary course of nature. Peter makes the ability of the demons to move bodies almost a matter of faith,[155] and he cites numerous instances from the Bible.

Before discussing how the demon deludes human senses Peter feels it necessary to explain the virtues and powers of the vegetative and sensitive soul, and the operations of the three cells of the human brain.[156] From vapors and fumes demons can simulate bodies, they can effect figures and colors, they can divert the species of objects in the air so that they do not reach the eye and the object remains invisible. They can produce air-drawn castles or make a man appear as a wolf. One who is well acquainted with the

[153] *Ibid.*, fol. 29r.

[154] In BN nouv. acq. 497 his discussion of this theme begins at fol. 4r.

[155] BN nouv. acq. 497, fol. 5v, "Et ista conclusio quam dico quod demones possunt corpora ad loca movere si non sit articulus fidei ex articulis tamen fidei demonstrative sillogizatur quod iam si quis negaverit necessario haberet omnes articulos negare."

[156] BN nouv. acq. 497, fols. 7r-8r.

virtue of natural objects by burning a lamp or candle can make the house seem full of serpents or corpses, which are all produced from divers species latent in the oil or the candle, but demons can work yet greater wonders than this.[157]

The power of generation, as that by which our first parents sinned, is especially subject to sorceries of the devil, and the serpent, as the cause of man's fall, is more subject to incantations than are other animals. Demons can produce temporary impotency and prevent the consummation of marriage. In such cases it is legitimate to appeal to the sorcerers to remove the objects which impede the natural operations, but not to resort to magic and demons to remove the impotency.[158] Although demons cannot generate and reproduce their kind,[159] they act as incubi and succubi. Of this Peter gives the usual explanation and adds that the demons pick a favorable constellation for the operation.[160] He also believes that demons really open locked doors for sorcerers.[161]

Peter rejects the contention of the Arabic philosophers that the magic arts owe their efficacy to the stars and the natural objects employed by magicians and adopts the explanation of Christian theologians and canonists that magic has its force from demons.[162] In his list of magic arts[163] or his discussion of dreams[164] and prophecy[165] there is nothing new or distinctive to note.

A word may be added concerning Henry de Gorichem, whose treatise on certain superstitious cases was printed separately in several incunabula editions from 1473 on and with the work of Petrus Mamoris in the edition of 1490.[166] It was, however, written about 1425. The superstitions with which it deals were chiefly concerned with ecclesiastical rites. The following is a fair

[157] *Ibid.*, fols. 8v-10r.

[158] *Ibid.*, fols. 11r-12r.

[159] *Ibid.*, fol. 12v.

[160] *Ibid.*, fol. 17r-v.

[161] *Ibid.*, fol. 18r.

[162] *Ibid.*, fols. 22v-24r.

[163] *Ibid.*, fols. 20v-21v.

[164] *Ibid.*, fol. 25v.

[165] *Ibid.*, fols. 26v-27r.

[166] *Tractatus de superstitiosis quibusdam casibus compilatus in alma universitate coloniensi per egregium sacre theologie professorem magistrum Henricum de Gorchen.* "In lectione novissima vestris me obligavi dilectionibus responsurum. . . ." The discussion of its nine propositions covers ten pages. MSS are Strasburg 98 (Latin 95), 15th century, fol. 144; St. Omer 295, 15th century. Hansen, *Quellen* (1901), 87-88, gives its nine propositions.

specimen. To write the names of the three kings on a scroll and suspend it about the neck from reverence for God and the same kings and to trust to them for aid is not illicit. But to believe that in the words themselves which have been inscribed there is any virtue of healing infirmities is idle and superstitious.[167] According to some authorities Henri de Gorkum or Gorichem was a Carmelite of Cologne, where he was vice-chancellor of the university and founder of the gymnasium of Monte and died in 1460.[168] Others more correctly place his death in 1431.[169] From the time when he was first admitted to subdetermination as a poor student in 1397 until his departure for Cologne in 1419,[170] his name appears with great frequency in the records of the English nation at Paris to which as a German he belonged.[171] He wrote the above mentioned treatise from the university of Cologne, as Peter was to write his from that of Poitiers. In 1427 he appears at the university of Rostock.[172] He was author of another brief tract discussing whether the practice of casting out demons from men employed by certain priests was licit and to be approved.[173] He also was one of those who discussed whether Jeanne d'Arc's visions were of God or the devil.[174]

The treatise of John de Turrecremata or Torquemada (1388-1468) *On the Efficacy of Holy Water* is primarily concerned with ecclesiastical usage rather than popular superstition. Of the latter and its censure we could find further instances in works on exorcisms such as those of Felix Hemmerlin of Zurich, whose

[167] This is the fifth proposition.

[168] Chevalier, *Répertoire,* 1905, I, 2083.

[169] *Chartularium Universitatis Parisiensis,* IV, 510, correcting Quicherat and others; A. Franz, *Die kirchlichen Benedictionen,* 1909, II, 559.

[170] Keussen, *Die Matrikel der Universität Köln,* I (1892), 168; I (1928), 212-213.

[171] See the indices of the *Auctarium Chart. Univ. Paris.,* for numerous references; also the index to the fourth volume of the *Chartularium.*

[172] Hofmeister, *Die Matrikel der Universität Rostock,* 1889, I, 29.

[173] Cologne Städtische Bibliothek GB 72, fols. 26v-28r, Tractatus de demonibus eiciendis: Utrum ad eiciendum ab hominibus demones practica qua quidam sacerdotes utuntur sit licita et approbanda. It was printed with other tracts by him at Cologne, 1503, and in the Lyons, 1669, edition of the *Malleus maleficarum.* Another MS is Vatic. 8956, 15th century, fol. 1.

[174] Quicherat, *Procès de Jeanne d'Arc,* IV, 411 *et seq.*

writings were later placed on the Index. But our chapter is already too long.

On the whole, with the exception of William de Bechis our learned censors of superstition of the middle of the fifteenth century, while they give us occasional interesting glimpses of public opinion and popular usage, are to a large extent bound by theological interest and literary and learned tradition. Both in their credulous tendency to repeat idle stories—most of which I have omitted—and their fondness for demonology they make a sorry showing in the rôle of censors, and might appropriately have been advised to practice what they preached, or rather to take the beams out of their own eyes instead of trying to remove the motes from those of the populace. It may prove something of a relief to listen to two inquisitors in our next chapter.

CHAPTER LII

TWO LIBERAL INQUISITORS

In the middle of the fifteenth century two well-nigh forgotten representatives of the holy Inquisition, Raphael of Pornasio and Franciscus Florentinus or Paduanus, discussed the magic arts and astrology. Their attitude to such matters is not entirely what we might have expected *a priori,* and therefore will repay looking into a little further.[1]

Among the treatises by theologians, inquisitors, and others on magic and demonology utilized by Joseph Hansen in his history of the rise of the witchcraft delusion and his collection of source materials to illustrate the same,[2] we look in vain for the *De arte magica* of Raphael of Pornasio. Yet he was an inquisitor of the fifteenth century, and his treatise discusses just the questions concerning the function of demons in connection with magic in which Hansen was interested and is a work similar to others used by him. The work of Raphael appears never to have been printed, but it is found in several manuscripts.[3] A note in the margin at the top of one manuscript seems to indicate that the volume formerly belonged to the inquisition at the Dominican convent in Bologna,[4] and so was not only written by an inquisitor but used in the activity of that institution. With our treatise is bound what appears to have been originally an independent manuscript containing various papal communications to inquisitors of Lombardy, the mark of Genoa, and elsewhere. Between the two intervenes a discussion as to what extent superstitious procedures to discover thieves are heretical and fall under the cognizance and jurisdiction of the inquisition.

Our treatise is listed among the unpublished works of Raphael of Pornasio by Quetif and Echard, and by Fabricius who follows their account. Pornassio is a small place in Liguria. Raphael is also spoken of as of Genoa (*Ianuensis*), since he was inquisitor there from 1430 to 1450. He is said to have died in 1465 or 1467.[5] At any rate he flourished about the middle of the fifteenth century, since he dedicated his book on the consonance of nature and grace to pope Nicholas V.[6] The recent editor of this latter treatise regards it as a covert defence of humanism, but it did not so impress me. Its primary purpose is rather to show by a collation of Gospel texts with those of ancient and Arabic philosophers that there is no necessary conflict between revealed theology and natural philosophy, and that as God made two great lights, the sun and the moon, for the universe or macrocosm, so for man, the microcosm, He provided the double illumination of nature and grace. This is an old scholastic tenet rather than a new humanistic contention, and natural philosophy was

[1] The portion of the chapter dealing with Franciscus Florentinus has already appeared in about the same form in the volume to commemorate the seventieth birthday of Father Mandonnet: *Mélanges Mandonnet: Études d'histoire littéraire et doctrinale du moyen âge, Bibliothèque Thomiste,* XIV, Paris, II (1930), 353-369.

[2] J. Hansen, *Zauberwahn, Inquisition, und Hexenprozess im Mittelalter,* Munich, 1900; and *Quellen und Untersuchungen zur Geschichte des Hexenwahns und der Hexenverfolgung im Mittelalter,* Bonn, 1901. The lack of indices in these volumes makes it very difficult to tell what authors and works they do or do not include, and greatly diminishes their utility.

[3] Bologna University Library 969, fols. 2r-34r, rubric, "libri de arte magica magistri Raphaelis de pernasio Ianuensis ordinis predicatorum Incipit prohemium." Incipit, "Contingit interdum invenire nonnullos adeo sensibus inhitentes. . . ." Explicit, ". . . ut veritas magis ac magis concussa splendescat. Finis huic operi. Et laus deo." Vienna 3155, 15th century, fols. 151r-174r, "Contingit interdum invenire . . . / . . . ut veritas magis et magis concussa splendescat." A third MS is Rome, Casanatensis A. VI, 14 (1480), 16th century, Raphael Pornasius Genuensis de arte magica.

[4] BU 969, "Iste liber pertinet ad officium inquisitionis existentis (? the abbreviation which I have so rendered looked like *Etis,* but might be intended for *sanctis,* if that would construe or make sense) conventu sancti dominici de bononia ordinis predicatorum."

[5] The former date is given in Franklin's *Dictionnaire des noms, surnoms, et pseudonymes latins de l'histoire littéraire du moyen âge,* Paris, 1875, col. 467. The latter date is given by Chevalier, *Bio-bibliographie,* II (1907), 3880. This date is supported by the explicit to Raphael's *De consonantia naturae et gratiae* in a Venetian MS which states that he died in 1467 at the age of seventy-nine: Valentinelli, I, 245.

[6] See page 9 of the text as published by Karl Michel, *Der Liber de Consonancia nature et gracie des Raphael von Pornaxio,* 1915, in *Beiträge zur Geschichte der Philosophie des Mittelalters,* Bd. 18, Heft 1.

a very different field from classical literature. The first part of Raphael's *De communi et proprio* was printed at Venice in 1508. Of his other writings, religious and legal in character, two were related to the conciliar movement of the first half of the fifteenth century.[7]

Raphael explains early in his treatise on the magic art that he had previously dealt with the same subject more briefly in a writing to Christopher of Reggio, a noted physician or physical philosopher, and that he now intends to discuss the matter more fully and deeply.[8] The opening chapters deal with the meaning of the word, magic, the antiquity of the magic art, its origin and effective cause, and natural proof of the existence of demons. Raphael takes up the usual theological position that magic is worked by the aid of demons, and a chief feature of his work is to determine how great are the powers of the demons in this regard. He believes that they sometimes render themselves perceptible to the human senses, that they can move material objects, transport human beings from one place to another, form worms in the body and bowels and so cause pain and disease, or produce generation or suffering by local motion and perturbation of the humors and spirits or disproportion of the first qualities. To the usual explanation of incubi and succubi that evil spirits, though themselves without generative organs or functions, effect generation by transporting the semen from male to female over a great distance instantaneously, Raphael adds the possibility of their effecting a sort of spontaneous generation. "From which things it may be gathered that it is not wholly

[7] Namely, *De potestate concilii,* and *Responsiones ad rationes Basileensis Concilii.* The following work is not listed by Fabricius: Wiesbaden 18, 15th century, fols. 293v-297: "Defensio gulgerica magistri Raphahel de Pornaxio ad reverendissimum dominum Georgium cardinalem de Flesco et Albingensi commendata etc. Postulavit a me vestra dominatio ut que presbitero Anthonio Gulgerico obici sentio breviter annotarem . . . / . . . non statim defendendum."

[8] Bol. Univ. Library 969, fol. 2v, "Cogitavi post eum compendiossum et brevem tractatum quem de hac re ad insignem phisicum magistrum Christoforum de Regio dudum scripseram nunc de eadem re altius ordiendo librum hunc edere latius materiam continentem." A table of contents of the headings of all twenty chapters is given in Appendix 53.

false or impossible which is reported today, forsooth, that certain women have sexual intercourse with demons under diverse forms."[9]

At the same time Raphael grants that many of the operations of magic and of the demons are illusory and fantastic. From the heading of his tenth chapter, "In which it is shown how one body can be in two places," one might infer that he believed this possible, but a perusal of the text demonstrates the contrary. In fact, no one then seems to have entertained the possibility of a material body being in two places simultaneously. Of the three explanations suggested for such a phenomenon as St. Ambrose's appearing to St. Martin at Tours at the same time that he was celebrating the mass at Milan, all assume that one of the apparitions was spiritual. One opinion is that the soul may leave the body, but Raphael holds that even demons cannot effect this and that death would result. A second opinion is that every human body has two spirits, one good and one evil, and that the good spirit never leaves the body but that the bad spirit occasionally goes off with the devil to perpetrate evils. This hypothesis also Raphael rejects as contrary to all philosophy and theology. The third alternative which he accepts is that the body really remains in one place but that angels or demons by fantastic appearance make it seem to be elsewhere. Many persons dream that they are doing this and that far away while they are actually asleep in bed all the time and are deceived by diabolical illusions. Raphael interprets the *Canon episcopi* as directed against belief in such illusions as real, for it is heresy and worse than heresy to attribute such powers of transformation and creation to demons. But he adds that the *Canon episcopi* does not preclude persons when awake being deported by demons or from going by night to assemblies where they worship the devil and commit fornications and other abominations, as is often found to be the case in the processes of the inquisition. Thus he explains away the *Canon episcopi* in the same way as Hansen has shown that other writers of the century did.

[9] *De arte magica,* cap. 18; Vienna 3155, fol. 171v.

In his next three chapters Raphael holds on the one hand that the magical transformation of men into animals or other forms is asserted by past Christian as well as classical writers, and on the other hand explains these as optical illusions and mere appearances or the effect of fascination. It is even possible by such means to make an object invisible, although it is right there before one's eyes.[10] He further holds that it is impossible for bodies to pass through closed doors but he believes that demons by their power of local motion may open such doors and close them afterwards. Some persons contend that magicians can harm men only by actually poisoning their food or drink, but Raphael cites authorities to prove that by words and incantations they can move the demons to injure others. That they also employ herbs, stones, parts of animals, and the bones of the dead is shown from their confessions and from their being seen at night robbing corpses. Raphael further believes that they injure others by sticking needles into images of them.[11]

Enough has been said to illustrate Raphael's own attitude, a remarkable combination of scientific limitation of the field and powers of magic and even of demons, with credulity in past anecdotes of historians, monks, and church fathers, and in recent confessions of supposed sorcerers and witches. Augustine is his great authority and one of course very credulous as to the power of demons in magic. William of Auvergne he seems not to cite, although John of Salisbury, Hugh of St. Victor, and Thomas Aquinas are used, and although the closing chapter on apparitions of horsemen and footmen rather suggests that thirteenth century writer. The work of a Dominicus Lyon on the spiritual universe is occasionally cited, as is Petrus de Palude on the *Sentences*.

More interesting to us than Raphael's authorities are his opponents, those men who would limit sorcery to poisoning or who do not believe that worms can appear in the bowels unless they were taken in with food,[12] or who laugh at those who say

[10] *Ibid.*, cap. 14.
[11] *Ibid.*, caps. 15-16.
[12] *Ibid.*, cap. 17: Vienna 3155, fol. 170r, ". . . unde grossos et rudes se ostendunt qui non credunt huiusmodi in stomacho posse esse nisi comedantur."

that they have been bewitched.[13] It was with such sceptics in mind that he opened his work by saying, "Occasionally one happens upon some persons who so rely on the senses that they think they should believe nothing which they do not perceive by sense."[14] It was with such disbelief in magic still in mind that he concludes with the remark,

> Moreover, this much has been said to make clear that those things which are commonly said to be and to be done by magic art are not entirely false and impossible but for the most part true. And if anyone is of the contrary opinion, let him speak and write not secretly but openly in order that from the increased discussion the truth may the more shine forth. (*or,* in order that we may beat out a brighter truth.)[15]

Thus he both admits the existence of a considerable scepticism as to the truth of magic, and displays a relatively tolerant attitude towards his opponents and readiness to hear their arguments, which may seem surprising to those who have been taught to regard every inquisitor as a dogmatic bigot. Indeed, instead of hounding on a vigorous offensive to result in the great witchcraft persecution, our champion of demonology and magic almost seems to stand on the defensive. Raphael's work to Nicholas V on the consonance of nature and grace also reveals him as a conciliatory spirit who would accept both theology and science and has no thought of the one persecuting the other.

Franciscus Florentinus or Paduanus was an author of considerable learning and repute in his own day, whose works were listed in some of the old histories of literature and of religious orders, but have since passed unnoticed. Of the treatise by him which we shall examine in some detail the past notices of its

[13] *Idem,* Vienna 3155, fol. 170v: "Ex quibus apparet irridendos esse quosdam qui irrident si quos audiant dicentes se vel alios similia mala a malis hominibus et maleficis perpeti."
[14] BU 969, fol. 2r, "Contingat interdum invenire non nullos adeo sensibus inhitentes ut nichil credendum ducant quod sensu non percipiant."
[15] *Ibid.*, fol. 34r, "Hec autem in tantum dicta sunt ut fiat manifestum quod ea que communiter dicuntur esse et fieri per artem magicam non omnino falsa sunt et impossibilia sed ut plurimum vera existunt quorum qui contraria sentit non clam sed palam loquatur et scribat ut veritas magis ac magis concussa splendescat."

author specify no manuscript, but there is one in existence in the Staatsbibliothek at Munich. It opens with an illuminated *titulus* occupying six lines in the manuscript, which may be translated:

The work of Brother Francis, surnamed of Florence or of Padua, of the order of Minorites, to each and all of the Inquisitors of wicked heresy, Concerning the Undependable Predictions of Certain Astrologers and likewise Concerning Enchanters and Diviners Who Are Not to Be Tolerated.[16]

Neither this treatise nor its author is mentioned by Lea in his chapter on magic and occult arts in the third volume of his *History of the Inquisition in the Middle Ages,* or by Joseph Hansen in his *Zauberwahn, Inquisition und Hexenprozess im Mittelalter,* (1900), and *Quellen und Untersuchungen zur Geschichte des Hexenwahns und der Hexenverfolgung im Mittelalter* (1901). Our treatise is the more important to notice since its attitude diverges considerably from the picture which Hansen and Lea have drawn of the treatises by other inquisitors and of the position of the inquisition in practice.

Francis was a highly educated man. On June 29, 1424, he received the master's laurel at Perugia, and on October 10, 1439, was admitted to the college of theologians at Florence, where in 1441 he became dean. According to Negri he was born at Florence, when is not stated, and there took the religious habit of the Franciscans in the convent of Santa Croce, but received his other name, the Paduan, from having long lectured at the university of Padua as professor. He was praised for his success both in letters and in the speculative sciences, as a preacher, jurist, profound theologian, and man of singular moral probity, and for both the style and substance of his writings. He had personal and literary associations with several successive popes, Nicholas V, Calixtus III, Pius II, Paul II, and Sixtus IV, who held him in high esteem, and also, as his writings show, had

[16] CLM 23593, "Fratris francisci florentini cognomento autem paduani ex ordine Minorum ad universos et singulos Inquisitores heretice pravitatis de quorundam astrologorum parvipendendis iudiciis pariter et de incantatoribus ac divinatoribus nullo modo ferendis."

relations with the Medici family at Florence. He probably died about 1480.[17]

Other writings by Francis than the one in which we are particularly interested may be briefly listed. To Braccius Martellus, a patrician of Florence, he addressed a book of christian institutes in forty chapters, and another on the excellence of man's condition. Of his *Breviloquium de epidemia,* addressed in September, 1456, to Piero de' Medici, there formerly were manuscript copies in both the Laurentian and Riccardian libraries of Florence, but the Laurentian copy has long since disappeared from its wooden covers which alone remain.[18] The work illustrates Francis' interest in astrology. He speaks of the stars as now "raging against us, and the distemper of the sky" of which he is conscious. He apologizes for the fact that he, a theologian, treats of a medical theme, but bases his treatise on many authorities including numerous judgments of astrologers. His citations comprise church fathers, Hippocrates and Galen, various Arabic writers, Aristotle, Albertus Magnus, and Constantinus Africanus, Alexander of Hales and Innocent III, and such fourteenth century authors as Petrarch and Petrus de Tossignano, or contemporary physicians like Timothy of Pistoia and Galileo of Florence who appear to have interpreted the pest simply as the result of contagion and to have minimized the astrological influence.

Francis also wrote letters to Piero on the occasion of Cosimo's death (1464), and letters of congratulation to Nicholas V and Sixtus IV upon their accessions to the papal see. He furthermore delivered orations in the pontifical presence. His treatise

[17] For the facts in this paragraph see Negri, *Istoria degli Scrittori Fiorentini,* 1722, p. 207; Sbaralea, *Supplementum et Castigatio ad Scriptores Trium Ordinum S. Francisci,* 1908, I, 269; and the earlier bibliographers whom they cite such as Michael Pocciantus, *Catalogus illustrium Scriptorum Florentinorum,* and Raphael Badius, *Catalogus Theologorum Universitatis Florentinae.* Fabricius and Chevalier add nothing.

[18] See the description in Bandini's catalogue of FL Plut. LXXIII, Cod. 30. Incipit, "Charitatem virtutum omnium esse principalissimam. . . ." For the Riccardian MS see Lami's catalogue of 1756, p. 202. Sudhoff has noted the work (*Archiv. f. Gesch. d. Medizin,* XVI (1925), 135-136) but simply on the basis of Bandini's description.

on St. Francis of Assisi seems to have been delivered to the people of Verona in the form of eight lectures or sermons.[19] Other works ascribed to him by Negri were: *De divinis operibus, De lapsu hominis, Liber de insensata cura mortalium ad huius vitae amatores decem proponens illusiones,* and *Tractatus de flocci pendendo vulgo et contemnendis eius ineptiis et de quidditate fortunae.* If the first three of these treatises suggest a religious viewpoint, the last smacks of the philosophy of humanism, although it retains the scholastic term, *quidditas.*

Similarly our Munich manuscript is written in a humanist hand and is presumably of Italian provenance, perhaps an autograph. The treatises by Francis which it comprises do not, however, occur in the chronological order of their writing. The *De quorundam astrologorum parvipendendis iudiciis* occupies its first fifty sheets and, instead of being addressed to Nicholas V as well as the author's fellow inquisitors, as Negri stated, was written in the second year of the pontificate of Sixtus IV (1472 or 1473), as an allusion on folio 16r shows. The author there refers to the fact that a recent astrologer had predicted that Sixtus would reign for only eight months, whereas he is now in the second year of his pontificate. But our treatise is immediately followed in the manuscript by another which neither Negri nor Sbaralea mentioned. It is a work addressed to Nicholas V in defense of humanistic studies against some opponent who had declared that St. Francis was hostile to learning.[20] After it comes

[19] *Tractatus de B. Francisco ad plebem Veronensem per octo dies:* see Laurent. Plut. XXVI, Cod. 19.

[20] The treatise extends to fol. 90v of the MS, CLM 23593. The following are its titulus, incipit, leading rubrics, and one decisive passage: "Eiusdem Fratris Francisci ad Sanctissimum Summum Pontificem Nicolaum V de non negligendo vel etiam abdicando studio litterarum tractatus. Est quidam B. P. sacerdotio tibi coniunctus clarissimi ordinis. . . ." Fol. 54r, "Prima obiurgantis seu detrahentis insulsa meditatio." Fol. 56r, "Secunda ipsius obiurgatoris longe insulsior impugnatio." Fol. 59v, "Tertia obiurgantis sophistica et dolosa obiectio." Fol. 64v, "Quarta obtrectatoris temeraria obiectio." Fol. 65v, "Per ea igitur sic catholice disputata liquido clarere videtur almum confessorem Christi franciscum nullatenus dicere debuisse litterarum studia negligenda esse aut quomodolibet relinquenda." *Idem,* "Responsio ad premissa detrahentis obiecta." Fol. 74r, "Responsio ad eiusdem emuli nostri obtrectatoris secundam obiectionem." Fol. 78r, "Tertia ad sequentem impugnationem responsio." Fol. 80r, "Responsio ad ultimam eius emuli impugnationem."

a briefer tract to a friend who loved this present life more than he should,[21] and three letters to Sixtus IV, the first congratulating him on his accession to the papacy,[22] the last written before he became pope.[23]

The treatise which we propose to analyze opens[24] with the statement that the author, having considered how readily unbelief or rather infidelity is engendered by "certain astrologers, or rather falsilogers, magi, diviners, enchanters and their like," who ascribe to creatures what belongs to God alone, as inquisitor is about to treat of them and their errors and how we may take care not to be deceived thereby.

The first third of our treatise deals with astrology and is very illuminating. It has often been assumed that medieval astrologers were in constant hot water with the ecclesiastical authorities and were persecuted by the inquisition. From a hasty glance at the title of Francis' treatise it might be inferred that astrology was the primary object of its attack, but a closer scrutiny of the wording reveals that only the predictions of certain astrologers are criticized. Towards the great science of astrology itself, as it indeed appeared to the middle ages of whose *Weltanschauung* it was the fundamental doctrine, our inquisitor maintains a most respectful and tactful attitude. This is again illustrated towards the close of the treatise when, after citing Augustine against the observance of days, such as the Egyptian days or Kalends of January, and of the courses of sun and moon, he hastens to add that this does not prohibit wise astrological observance of days and hours.[25] It is only to

[21] *Ibid.,* fols. 91r-100v, "Eiusdem Fratris Francisci ad amicum quendam vite presentis plusquam expediat amatorem."

[22] *Ibid.,* fols. 101r-105v, "Fratris Francisci Florentini cognomento autem Paduani ad sanctissimum summum pontificem ex ordine minorum nuper assumptum Sixtum Quartum congratulatoria epistola incipit feliciter."

[23] *Ibid.,* fol. 106v.

[24] *Ibid.,* fol. 1r, "Tractatus incipit. Cogitanti mihi quanta felicitate per inconsultam quidem incredulitatem verius infidelitatem. . . ." The closing words are: fol. 50v, ". . . ad instruendas simplices hominum mentes ne cum diabolo pereant et imitatoribus eius sed deo serviant per infinita secula seculorum. Amen. Explicit deo gratias."

[25] CLM 23593, fol. 38r-v.

those astrologers "who often inadvertently pervert the Catholic faith" that he raises objection, "not because the science of the astrologers is not most true," but because its professors are sometimes imperfectly trained and make mistakes.[26] "For no one can come to a knowledge of his Creator more accurately than by the aid and effects of the celestial bodies."[27] Francis grants that it is useful to know the hour of death in advance in order to prepare for it. He cites Hippocrates, as he supposes,[28] the primate of physicians, that one should not entrust oneself to a doctor who is unskilled in astrology. And in the treatise on air Hippocrates says that its diversities and variations come from the stars. Our author even cites the *Greater Introduction* of the Arabic astrologer, Albumasar, for the assertion that Noah knew of the coming of the flood a hundred years in advance by virtue of the astrological knowledge vouchsafed to him by God.[29]

The subject of Noah's flood turns our author's thoughts to Peter of Abano or Padua "who among astrologers was more than moderately expert and in the art of medicine was famous." At this we are all attention because it has often been said that Peter died while undergoing trial by the inquisition and escaped burning at the stake only by this timely natural death. I have discussed elsewhere the lack of evidence for this assertion and various indications to the contrary[30]; let us see what our fifteenth century inquisitor has to add. He informs us that Peter was

[26] CLM 23593, col. iv, "Et quum astrologi inter ceteros non mediocriter peritos potissime *illi sunt qui fidem captolicam* (*sic*) inadvertenter sepe pervertunt. Hoc autem non quia astrologorum scientia verissima non sit, sed quia illam professi persepe non integriter disciplinati falluntur, disserendum iudicavi oportuneque indagandum an debeamus astrologorum iudiciis intendere et illorum pronosticata credere."

[27] *Ibid.*, fol. 2r, "Nemo enim in conditoris cognitionem accuratius quam si de supercelestium corporum ope eorumque effectibus devenire potest."

[28] The work on astrological medicine from which the citation comes was incorrectly ascribed to Hippocrates in the medieval period, but our author cannot be blamed for accepting that ascription, since it had been translated into Latin as by Hippocrates by as learned men as William of Moerbeke and Peter of Abano.

[29] *Ibid.*, fol. 2v, for all the foregoing statements.

[30] *Magic and Experimental Science*, II (1923), 938-947; and additional materials in "Relations of the Inquisition to Peter of Abano and Cecco d'Ascoli," *Speculum*, I (1926), 338-343.

suspected of heresy and summoned before the papal court at Avignon because he had taught in his classes that the flood was the necessary outcome of the influence of the stars. But he was finally absolved by all the council when he said that while the deluge was partly a matter of natural necessity, it was partly a matter of secret divine dispensation. This must have been some time before his death, since our author states that in memory of the affair and his acquittal Peter edited a remarkable volume called *Concilium*. If by this he means the *Conciliator*, as he seems to do, there would appear to be a confusion, since the *Conciliator* has usually been dated of 1303, while the popes did not take up their residence at Avignon until 1308. Sante Ferrari, however, without knowledge of this passage in Franciscus Florentinus, has already contended that the *Conciliator* contains an allusion to Peter's presence at the bedside of the dying marquis of Este, Azzo VIII, in 1308, and so has accepted the statement in the explicits of certain manuscripts of the *Conciliator* that it was completed in 1310.[31] Our author continues, apparently referring to Peter's utterances in the *Conciliator*,

> And so he asserted that the said deluge had come under the dominion of certain stars, that is, from that great conjunction of Saturn and Jupiter. But that it had increased in such vast quantity and filled the whole world with waters, he declared was a matter of divine dispensation.

That some such compromise between astrological theory and the Scriptural narrative should have proved satisfactory to the religious authorities of Peter's time, the early fourteenth century, and also to our inquisitor of the fifteenth, is perhaps not more than we should expect. But we are rather taken aback when Francis goes on to speak in high terms of approval of Peter's doctrine of the influence of the stars upon the progress of civilization and the history of religions. We had perhaps best quote what he has to say in full.

[31] Sante Ferrari, "Per la biografia e per gli scritti di Pietro d'Abano," *Atti dell' Accademia dei Lincei; Memorie della classe di scienze morali*, XV (1918), 629-727.

For as he very beautifully taught his disciples, when about 1400 years had passed since the beginning of the world, a greatest conjunction of the two planets who are above the rest, Saturn and Jupiter, occurred in the first division of Aries, in which, since Saturn had assumed the lordship, the manners of men were wild, savage, and uncivilized. And at the time agriculture was the chief occupation, but the men then did not seek after pleasing foods or ornate clothing. And from the rule of that planet after the conjunction of those two planets, the earth, as has been said, was covered with a very great flood of waters.

Then after a thousand years those two superior planets met in the beginning of Aries, and Jupiter assumed the lead with the participation of Saturn. Thereupon the reign of law began and first came Judaism, whence men were serious, modest, and with high moral standards.

At length when Mars which is the third planet met them in the same spot and took control, the ardor of war began and exercise of arms.

Again they met, and the sun assumed the lordship of the conjunction, and then the Egyptian religion arose, which, inasmuch as it is the mother and source of idolatry, bade that the militia of the sky and stars be adored whose chief is the sun. And then men were more vigilant with zeal for honors than at other times.

Afterwards, as I think, six hundred years having passed before the virgin birth, they were in conjunction with Mercury which bestows science, wherefore just as it was characteristic of the sun to bestow liberality, magnificence, and the science of government and to make men most intense, so it was Mercury's function to give knowledge of life but with austerity. Whence our religion arose and other disciplines, and men devoted themselves to the study of the sciences. For at that time flourished those supreme philosophers, Socrates, Plato, and Aristotle, and many poets, as in this millenium of years under the power of Mercury men made great strides in science.

But last now after eight hundred years they were in conjunction, and Venus, that most voluptuous planet, took the leadership in the conjunction, and from this the sect of Mohammed prevailed, when each thought he ought to embrace pleasures, and men were further given over to most ornate vestments and every luxury.

Finally to be expected is the coming and last conjunction which is ascribed to the moon, not more than one hundred and sixty years after this latest conjunction, in whose time unless the infallible order observed by the Lord is passed over, will arise the reign of antichrist.

Wherefore from what we have just said, no one of sane mind will deny that not merely the natures of the least and mediocre things but also the religions and condition of the whole world and the manners of men, are ruled, changed, and established by the celestial bodies. Hence therefore we see the men of the present time become more ready and prone for every evil work, deficient in faith, most cold in celestial matters, in things mundane, mean, and small, most fervent. On which account the skill of astrologers is to be highly esteemed which confers upon us inestimable goods and divine benefits.[32]

I do not know of any passage in the *Conciliator* which corresponds at all exactly to the exposition which we have just heard from Francis, but the general tenor and theory represents with essential accuracy Peter's point of view as expressed both in several passages of the *Conciliator* and in his treatise on the movement of the eighth sphere.[33]

Very different is our inquisitor's approving paraphrase of Peter's astrological interpretation of history from what the modern historian of the medieval inquisition has given us to understand would be its reception. Lea writes of Peter's doctrine,

> Even worse was his Averrhoistic indifference to religion manifested in the statement that the conjunction of Saturn and Jupiter in the head of Aries, which occurs every 960 years, causes changes in the monarchies and religions of the world as appears in the advent of Nebuchadnezzar, Moses, Alexander the Great, Christ, and Mahomet—a speculation of which the infidelity is even worse than the chronology.[34]

But it is evident that our inquisitor sees no suggestion of infidelity or religious indifference in Peter's relation of the history of civilization and religion to the conjunctions of the planets. We have heard the theory of conjunctions attacked by Henry of Hesse, but in the main accepted by cardinal Pierre d'Ailly,

[32] For the Latin text of the passage see Appendix 54.

[33] Tractatus motus octave spere, Distinctio quarta, cap. 1; fol. 81v in BL Canon. Misc. 190. I have summarized this and the other passages in *Magic and Experimental Science,* II, 895-898.

[34] H. C. Lea, *A History of the Inquisition of the Middle Ages,* III (1887), 440. The passage referred to occurs in the *Conciliator,* Differentia IX, in the course of the paragraph opening, "Propter tertium. . . ."

who had objected, however, to the suggestion that the Christian religion was under the planet Mercury.[35]

On the other hand, d'Ailly had insisted that the nativity of Christ and the virgin Mary, in so far as they were natural human beings, could not be freed from the laws of nature and control of the stars,[36] whereas the inquisitor Francis asserts that the astrologers exceed the limits of their science in discussing the star which led the Magi of the east to the cradle of the Christ child.[37] This, he holds, was not an ordinary star, planet, or constellation, but a new creation in the air.[38] It was with this matter that the error of Cecco d'Ascoli was associated, for which he was convicted of heresy by the inquisitor of Florence and deservedly burned to death. For he taught in his classes and set forth in a book that the Son of God, Christ Jesus, the redeemer of the human race, was born or conceived under the constellation of the star from the east which led the Magi, and that of necessity from the influence of that star he led the life of a poor man, lying in the manger with the ox and ass, and suffered all that he did down to his death. And that the said kings came to Jerusalem under the influence of that same star.

What pray more profane and execrable could that heretic have put forth or imagined than to say that the Creator of all thus took on human form for us from the influence of the heavenly bodies and did not voluntarily suffer His passion and crucifixion?[39]

Thus our author not only furnishes negative evidence against any trial or condemnation of Peter of Abano by the inquisition just before his death, but also adds his positive contribution to the many explanations which have been offered why Cecco d'Ascoli was burned at the stake.[40] We wonder whether his statements concerning these men are based upon records of the

[35] See his treatise *Concerning Laws and Sects against Superstitious Astronomers,* written December 24, 1410.

[36] Especially in his *Vigintiloquium,* Verbum 5, but also elsewhere in his works.

[37] CLM 23593, fol. 5r.

[38] *Ibid.,* fol. 13r.

[39] *Ibid.,* fol. 12v.

[40] For these and further bibliography see *Magic and Experimental Science,* chapter LXXI, "Cecco d'Ascoli," II, 948-968; and article in *Speculum,* I (1926), 338-343. "Relations of the Inquisition to Peter of Abano and Cecco d'Ascoli."

inquisition to which he would have access, or whether he is simply depending upon other written accounts and oral tradition. What he says concerning the heresy of Cecco might well be based upon Villani. He later tells a story of Abano which sounds like an unreliable anecdote or popular legend, since it is merely a repetition of the old story of Alexander and Nectanebus.[41] A client asked Peter what length of life the stars allotted himself and, on being told that he (Peter) would live a long time, drew his sword and gave the astrologer a great scare by pretending to be about to kill him, thus teaching the astrologer a wholesome lesson as to the uncertainty of his art.[42] But Cecco d'Ascoli was burned as a heretic, not as an astrologer.

It seems clear that to our author's mind the heresy of Cecco consisted not merely in identifying the star of the Magi with an astrological constellation, but in denying the exercise of free will even to Christ. Although Francis quotes Augustine, Gregory, Ambrose in the *Hexaemeron,* and Lactantius, his chief contentions anent astrology are these. Freedom of the will must not be destroyed, or man will not be man.[43] More than once he repeats the dictum of Ptolemy that the wise man rules the stars, thus recognizing that astrology itself admits freedom of the will. Secondly, the professors of that discipline must keep in mind that nature can accomplish nothing against the Lord of nature.[44] "For granted that the stars have virtue and the greatest power over inferior bodies, yet have received the influence which they exercise limited by the Lord of nature."[45] Theologians by no means despise astrology, but they do think it fallible, not because of

[41] Indeed that Francis did not mean it to be taken seriously is indicated by his introducing it with the remark (CLM 23593, fol. 14v), "In argumentum predictorum volo advertamus ad nonnullas veterum facetias vel ineptias."

[42] *Ibid.,* fol. 15r, "sicque ipse Petrus astrologus cognovit astrologiam sibi nec prodesse."

[43] CLM 23593, fol. 11r.

[44] *Ibid.,* fol. 10r, "Itaque usque modo sic deducta volo sufficiant tam pro comendatione astrologie quam pro evacuatione eorum que non recte ac digeste sentiuntur ab eis. Reminiscantur igitur ipsius discipline professores quod non potest natura contra nature dominum."

[45] *Ibid.,* fol. 10v, "Esto namque quod astra virtutem et vim maximam super inferiora corpora habeant, limitatam tamen qua pollent influentiam a domino nature susceperunt."

any inherent defect in the art itself, but because its practitioners are sometimes mistaken.[46] As Francis says later in speaking of other forms of divination, some future events such as eclipses may be predicted with certainty; others, such as the weather, may be predicted conjecturally; while contingent events only God can foretell.[47] For one of the four things which God reserves to Himself is the knowledge of all future contingent events.[48]

Towards other forms of divination than astrology our author is unfavorable. "O how greatly to be derided are those who by deception of the magicians seek to predict length or brevity of life from looking at the nails . . . or the lines in the hand!"[49] Similarly divination by lots, if a matter of "human inquisition," is prohibited at all times and everywhere, and execrable.[50] Our author's unfavorable attitude towards the observance of Egyptian and other such lucky or unlucky days has been already touched upon.

Concerning *magia* or magic Francis adopts the usual orthodox theological position that it is the same thing as the invocation of demons.[51] He also follows the traditional view as to the vast powers possessed by demons. These impure spirits are able to work such great marvels and seeming miracles because they have known every faculty of nature from the beginning, and so can enable enchanters to operate without delay what medical men can effect only with difficulty and in process of time.[52] Hence magicians often perform cures which the most skilled physicians

[46] *Ibid.*, fol. 10r, "Nunc vero secundum theologorum scolam loquendum restat, qui quamquam astrologiam minime despiciant fallibilem tamen ideo affirmant, non quia ex se iacturam ullam sapiat sed quia nonnumquam falluntur eius sequaces."

[47] *Ibid.*, fol. 46r-v.

[48] *Ibid.*, fol. 17r, "Quattuor namque ut theologis placet sibi deus reservat, videlicet impii iustificationem, rerum creationem, cognitionem omnium futurorum contingentium, sueque glorie largitionem."

[49] *Ibid.*, fol. 33r.

[50] Francis distinguishes different varieties of lots as follows: fol. 45r-v, "Verumtamen notandum est quod sortium quedam sunt terrene possessionis, altere divine predestinationis, relique vero humane inquisitionis. Harum scilicet humane inquisitionis sortium quedam est divisoria quedam consultoria et quedam divinatoria et ista est omni tempore et loco prohibita et execrabilis."

[51] *Ibid.*, fol. 18r, "Amplius ut de Magis a magia quidem dictis quod idem sonat quam demonum invocatio. . . ."

[52] This point is made thrice: see fols. 21v, 23r, and 43r.

cannot equal, and hence old-wives are preferred by the populace to the most famous doctors.[53] Moreover, the demons are crafty and deceitful and send diseases simply in order to be able to cure them subsequently, taking care to inflict such complaints as they are able to cure.[54] If human artists are able to paint lifelike figures, how much more are the demons able to simulate and feign bodies?[55] Hence the apparitions by which they have striven to outwit the saints.[56] As Augustine has shown, it was not really Samuel but a demon in his guise that the witch of Endor made appear to Saul.[57] Also the demons can deceive the imagination and influence dreams.[58] There follow the familiar explanations of the ability of the demons to divine the future, such as their long life and experience.[59] Indeed, the whole discussion of magic and divination and the nature of demons is such as may be found in Augustine, William of Auvergne, the thirteenth century bishop of Paris, and various other authors.

Somewhat more out-of-the-way, though by no means unprecedented, is the position which Francis twice assumes that it is lawful to study magic if one does not practice it, or only to practice it in lawful ways in order to prevail against the demons and cure their victims. One of the passages to this effect has been crossed out in the Munich manuscript,[60] apparently by some disapproving reader, while the second passage has been left untouched.[61] In it Francis further argues at length with citations

[53] *Ibid.*, fol. 23v.

[54] *Ibid.*, fol. 24r.

[55] *Ibid.*, fol. 41r.

[56] *Ibid.*, fol. 42r.

[57] *Ibid.*, fol. 41v.

[58] *Ibid.*, fol. 44r-v.

[59] *Ibid.*, fol. 47r.

[60] The passage, occurring at fols. 38v-39r, through which a line has been drawn, runs as follows: "Itidem neque prohibemur magicas artes discere ad hoc solum ut sciamus, non tamen operemur nisi quantum honestis modis et non prohibitis nitamur adversus demones prevalere et ab eis ofensos curare, eo semper salvo quod per te incantationes oppositas nullatenus contingat divinam offendere maiestatem atque cuiusvis hominis saluti obiicere quemadmodum plurimi deo adherentes lesis hominibus obsequi curaverunt. Nam Aurelius Augustinus inter ceteros quandoque didicit magicas artes non tamen opere (?) institit eis sed solum ubi intellexit honesta et deo grata atque hominibus comoda in operam dare ut prefertur."

[61] Of the second passage which begins on fol. 48r we may quote the following portion from fol. 49r: "Denique oportunum necessariumque videtur scire et investigare quibus modis a demone decipiantur et illudantur homines quod

of authorities that science is permissable whether it be of good or bad things.

These passages are followed by two others in which Francis surprises us by holding that not all incantations are connected with demons and evil. In the first passage he states that a careful distinction must be made between incantations, since some are simple incantations invented for human advantage without offense to God or dependence on demons or deception by enchanters. These, he continues, are to be judged licit and proper, provided they are employed with faith in God and without prohibited admixture of times, places, and ceremonies, in which the common people believe divine power is involved. But he further adds that it is to be noted that the remedies instituted by the church against the works of demons are sufficient for us, such as the interposition of the Lord's Prayer, sign of the cross, or name of Jesus.[62]

In the second passage the emphasis is different. Here it is asserted that if some incantations are found free from any admixture of invoking demons or other superstition, they are none the less generally prohibited by the church except those employing the Lord's Prayer, sign of the cross, name of Jesus, and invocation of the most holy Trinity, not because there is anything intrinsically wrong with the others, but lest by their use simple minds take occasion of falling into idolatry.[63] Thus one reason why Francis does not disapprove of all incantations is because he extends that word to cover certain licit uses of divine

maxime per disciplinam sepe dicte magice artis disci potest sicque noscere remedia adversus eundem ut per opposita resistere diligenter et accurate valeamus falaciis dolis et deceptionibus eius. Demum possimus etiam deceptos ab eo illuminare et offensos quovis modo liberare egrosque atque vexatos ubi sine offensa dei fieri possit sanare, si quo pacto demonum nullum intervenire contingat presidium."

[62] *Ibid.*, fol. 39r-v.

[63] *Ibid.*, fol. 50r-v, "Si que vero alias invente fuerint nonnulle incantationes quibus nulla sit admixta demonum invocatio aut quevis superstitiosa deprecatio, universaliter ab ecclesia sunt prohibite exceptis illis que medio dominice orationis simboli gloriosi nominis yehsu atque invocationis divinissime trinitatis, non quidem abstinere ab eis debemus eo quod de se habeantur indevote vel quomodolibet inlicite sed tantum per accidens ne opere earum mentes simplicium . . . etc."

names and prayers. But he further recognizes a third kind of incantations which are not diabolical or intrinsically harmful. He appears anxious that other inquisitors should not regard the employment of this third type of incantation as evidence of magic or heresy. He would probably discourage by a light penance any uneducated layman whom he found tampering with such incantations, but would have little objection to their use in medicine by a properly qualified doctor of medicine. This amounts to a reversal of Gerson's censure of the physician of Montpellier.

While Francis regarded this third type of incantation as innocuous *per se,* he could not, consistently at least, have had much faith in its efficacy, since he had earlier in the treatise denied any peculiar virtue to particular words and letters except those employed in the divine sacraments of the church. He mentions, however, that the magicians and sorcerers pretend that there is great virtue in the words of their incantations and lead simple-minded persons to think that there is some divine power in words.[64] On the other hand, Francis assents to the doctrine, universally accepted in the middle ages, that there is great virtue divinely implanted in gems,[65] and he presumably held the theory, equally widespread then, of occult virtue variously disseminated in natural objects. For in one place in defining a miracle he explains that many cures worked by doctors would seem miraculous to simple men, to whom the most occult virtue of herbs, precious stones, and other like substances is unknown, but to medical men and astrologers is most manifest.[66]

If our inquisitor is lenient towards astrology, the mere study of magic, and the use of harmless incantations in medical practice, he is much stricter in the matter of popular superstition and observances. For example, he regards birthday celebrations

[61] CLM 23593, fol. 24r-v.

[65] *Ibid.*, fol. 24r, "Nec dubium debet alicui falsumve videri quin sua sit virtus ingens divinitus insita gemmis." The sentence is almost identical with a line in the Lapidary of Marbod.

[66] *Ibid.*, fol. 21v, ". . . sicuti est interdum sanitatum remedia egrotis exibere multa que licet videantur miraculosis modis fieri, id tantum apparens est non tamen existens pro eo quod virtute quorundam olerum pretiosorum lapidum aut aliarum similium rerum quarum occultissima virtus licet simplicibus hominibus sit ignota, medicis tamen et astrologis manifesta est."

as a "detestable error, and the more reprehensible because educated men have fallen into it." Holy mother Church wishes no natal days of men to be celebrated except of those who were born without original sin such as Christ, his mother, Jeremias, and John the Baptist. We should celebrate Christmas instead of our own birthdays. Then we may light yule fires and exchange gifts.[67] Francis classes as an execrable invention of the devil the writing sacred words on the host and having the sick partake of it thrice.[68] He also censures the practice of blowing on diseased spots or members on Thursday at sunrise from a fasting stomach with the thread of a virgin girl or cotton wool or the skin of an unborn animal, accompanied with words of incantations.[69] He further condemns those sufferers from epilepsy who dance all day long on St. Bartholomew's day in the hope that this will free them from their disease for the remainder of the year. Instead, he says, some have so exhausted themselves that they have died and gone to hell instantly.[70] Another superstition is that those herbs which are collected on the eve of the nativity of St. John the Baptist possess special virtue.[71] Or who can enumerate all the popular auguries from the meeting of certain animals?[72] Then there is the custom of repeating an incantation to cure toothache and at the same instant fixing a sword in the earth.[73] But our inquisitor always ascribes such practices to sorcerers and old-wives—*magi, malefici, muliercule,* never to medical men or astrologers.

Those popular superstitions just named may be associated with magic. But Francis also opposes the superstitious exaggeration of Christian rites.[74] He regrets that sometimes even learned men and the clergy sanction such customs as on the day of St. Agatha the virgin singing the antiphony, *Mentem sanctam,* through the streets and squares and writing it on candles, or

[67] The argument against birthday celebrations extends from fol. 13r to 14r.
[68] *Ibid.,* fol. 22v.
[69] *Ibid.,* fols. 22v-23r.
[70] *Ibid.,* fol. 26r.
[71] *Ibid.,* fol. 34v.
[72] *Idem.*
[73] *Ibid.,* fol. 35r.
[74] The following examples occur at fols. 29r-30r.

a similar procession on the feast of the Purification of the Virgin, or the making a cross of olive boughs on Good Friday and offering a penny to the cross to carry afterwards as a charm, or the offering twelve candles, one per day for twelve days, to the twelve apostles as a means of gaining one's wish. Others think that if they repeat daily certain verses ascribed to St. Bernard, they will not die unabsolved. Others think that by having a thousand masses said for them they can escape the demons or future punishment, or that by special masses they can acquire certain desired graces. Others think that eggs laid on Ascension Day possess a peculiar virtue. These and similar superstitions, although they may sometimes be helpful accidentally or by their psychological effect, must not be thought to bring the benefits sought as a matter of course, since this would be ridiculous and would be wholly denied by those trained in law.[75] Referring to the fact that sorcerers pretend to make use of the milk of the Virgin in bottles, Francis states it cannot be found except by a miracle, and that the blood shed by Christ on the cross is ridiculously believed by men to be still in existence in various places, while others sell bones under the pretense that they are those of certain dead saints.[76] But he credits the special virtue of holy places.[77]

What, however, is noteworthy about our inquisitor is that throughout his treatise he makes no criticism of men of learning or of what we may term the magic of the learned, that is, occult

[75] *Ibid.,* fol. 30r, "Que et similes superstitiose obsecrationes, quamvis utiles nonnumquam esse valeant, non tamen licet determinate credere postulata beneficia inde recipere pensatasque advenire sequelas, cum sit hoc ridiculosum et a peritis iuris omnino reiciendum."
[76] *Ibid.,* fol. 33r-v, "Ut est insuper a maleficis fatua credulitate in ampullis recipere lac genitricis chrysti confictum quod non est reperire nisi miraculo nobis concessum prout in oppido montis Varchi esse vulgatur, quod et de sanguine christi in cruce perfuso ridiculose ab hominibus creditum diversis in locis. Que omnino ridiculosa sunt pro eo quod virgo ipsa ubere de celo pleno lactavit filium fidem (eidem?) ad necessitatem tantummodo desuper ministrato, nec redemptoris nostri sanguinem superfluisse a multis doctis viris creditur vel asseritur cum deus et natura ut philosopho placuit nihil agant frustra. Vendunt itidem loco et nomine sanctorum quorumdam ossa defunctorum simplicibus hominibus existimantibus sacra esse."
[77] *Ibid.,* fols. 27r-28r.

science. His attack is directed against popular superstitions and diabolical practices. For learning he has the utmost respect and no suspicion. For science he is ready to make every allowance. His concern is to keep simple men straight and preserve them from magi, malefici, and diviners. Even in the case of such persons and practices his tone is hortatory and monitory rather than minatory.[78] For some pages he rather pleads with them against such observances than threatens penalties or seems to entertain any real hope of putting a stop to these superstitions and forbidden arts.[79]

The witchcraft delusion was well under way by the time our treatise was written (1472-1473). The very next year Heinrich Institor, one of the two authors of the *Malleus Maleficarum,* became inquisitor in Upper Germany. In 1484 Innocent VIII, the pope following Sixtus IV (under whom our author wrote and with whom he had personal relations) issued his famous bull on witchcraft. We might therefore expect any work by an inquisitor on magic, divination, and popular superstitions to be full of allusions to witches and their sabbats. But our author hardly mentions such matters. His closest approach thereto is in two of the anecdotes he tells. One is of a man who had a letter which assured him that he would not die so long as he kept it in his possession. Becoming very sick, he consulted a priest, but would not let go of his letter for fear lest he die, although the priest refused to absolve him unless he gave it up. The result was that he died unaneled just as the devil had purposed.[80] The other story is of an old-wife of the diocese of Lucca whom the inquisitor at Florence discovered was a follower of the devil in this manner. A man who had lost a large sum of money went to this enchantress (*incantatrix*) to find out what had become of it, and was told by her to come for his answer the following day. Curious as to what she would do in the meantime to obtain an answer for him, he hid near her house and saw her gaze at the stars and invoke the demon to show her the truth concerning

[78] See fol. 40v, "Sinant ergo magi . . ." etc.

[79] See fol. 35r *et seq.*

[80] *Ibid.*, fols. 31r-32r.

the lost money. The demon then made reply, "The truth is that it fell into the garbage and the pig ate it, but I want you to tell him that his wife gave it to the priest who committed adultery with her." The eavesdropper thereupon also turned talebearer and informed the inquisitor, who killed the pig and found the money. "Wherefore to punish the magnitude of the crime the enchantress was handed over by the same inquisitor to the flames."[81] This story, which is told to discourage men from consulting soothsayers and to show the diabolical basis of their art, is indeed rather discreditable to the inquisition, which is represented by one of its own members as accepting what seems questionable evidence, since the informant may have known that the pig ate the money, or have fed it to the animal himself, and have concocted this plot against the woman out of malice.

But inasmuch as this tale and the passage concerning the fate of Cecco d'Ascoli are the only cases where our author mentions burning at the stake with approval, he cannot be regarded as manifesting the spirit of persecution or the passion for witch-hunting to any such degree as historians of the inquisition or of witchcraft have often given us to understand was the case with his fellow inquisitors. Apparently some inquisitors were men of moderation and not merely learned themselves but with a deep respect for learning in general. If there is any criticism to be made of our author, it is rather that he is too tolerant of astrology and some other forms of occult science, but of course these were generally accepted in his time. And the fact that in the year 1472-1473 an inquisitor, of all persons, could treat at length of astrology, magic, divination, and popular superstition with scarcely a passing reference even to witchcraft and the conception of the witch as given by Hansen, suggests that in the broad field of occult science and superstition in the fifteenth century the witchcraft delusion did not occupy so prominent a place as some have been inclined to accord it.

[81] *Ibid.*, fols. 19r-20r, concluding, "Quare ad puniendam sceleris magnitudinem incantatrix mulier ab ipso inquisitore igni tradita est."

CHAPTER LIII

ALCHEMY THROUGH THE FIFTEENTH CENTURY

The fifteenth century seems poor in alchemical compositions compared to the fourteenth, although alchemical manuscripts are much more numerous for the later century. But they are largely devoted to the collection and preservation of works which originated much earlier. In the fifteenth century there were no such famous names or notable works as those of Arnald of Villanova, Ortolanus, Petrus Bonus, Bernard of Treves, and Raymond Lull. Its smaller caliber in matters alchemical is indicated by such names as George Ripley and Christopher of Paris. An occasional fixed date enables us to essay something approaching to a chronological outline. It is also true, however, that there are a number of authors or reputed authors of alchemical treatises whose names and writings have come down to us, but whom we cannot date with certainty either in the fourteenth or the fifteenth century.

It is a striking fact that there are practically no incunabula of alchemical works, which remained unprinted until the sixteenth century.* This seems to indicate that the public demand for such books was not great, perhaps likewise that not many persons were producing them, or else that it was felt not in accord with alchemical injunctions of secrecy to give the archana of that art to the printing press. This lack of printed editions also suffices to explain the large number of fifteenth century alchemical manuscripts extant.

A number of authors to whom alchemical treatises are attributed and whom we have not yet mentioned may be briefly listed here as very probably of the fifteenth century or at least not later, since for the most part the treatises occur in manuscripts of that period. Within this category fall Aegidius de Vadis,[1] Antonius de Abbatia,[2] Antonius Burgundio,[3] Feovernus of Aragon and a master Durantius who worked at the court of Castile,[4] a brother Ferrarius who addressed a letter to the pope,[5] a brother Franciscanus—or perhaps merely a Franciscan friar—who did the same,[6] Frederick of Bologna,[7] Francis of Perugia,[8] Guido Montaynor,[9] author of the *Ladder of Philosophers,* who cites Raymond Lull on alchemy and so is probably of the fifteenth century,[10] John of Ferrara, author of a *Candelabrum* in seven parts,[11] John Galacius or Gallacius or of France (*Gallicus*),[12] John of Grenborough, John of Cripplegate, and John Snell of Wigmore,[13] Laurentius Luci or Luti,[14] Nicholas of Spain,[15] Nicholas Rabenner of Breslau,[16] Peter of Naples,[17] and

* An exception is the undated incunabulum, printed at Rome by Eucharius Silber, of the *Summa, Liber trium verborum,* and *Investigatio magisterii* of Geber, an *Epistola Alexandri,* and some alchemical verses, in part attributed to Cecco d'Ascoli and brother Elias: BM IA. 19199, *Catalogue of Books Printed in the Fifteenth Century,* IV, 124.

[1] DWS Nos. 327-329; 105, vii; and consult the Index (III, 910), where the statement "*fl.* 1532" scarcely agrees with the presence of works by him in MSS of the 15th century.

[2] Geneva 82 (151), 16th century, fols. 35r-37v: "Incipit epistola verissima composita per me. . . . Antonium de Abbatia et per me probata de transmutatione metallorum. . . ."

[3] DWS No. 338B. The Index (III, 913) identifies him with Antonius Burgensis (1455-1525), professor of law at Bologna and secretary to pope Leo X.

[4] DWS Nos. 352; 344, where the name is spelled Durantis, but Scott's *Index to the Sloane Manuscripts* and the old catalogue in long hand give Durantius.

[5] DWS No. 309. The Index (III, 935) suggests that he may be Adam Ferrarius who died in 1383. See my III, 149.

[6] BU 270 (457), 15th-16th century, vol. XXI, 4; "Tractatus operis philosophorum cuiusdam fratris Franciscani ad pontificem. Quanta admiratione . . . / . . . vel ad lunam."

[7] DWS No. 348.

[8] DWS No. 298. The Index, however, would identify him with the professor of medicine who flourished about 1357.

[9] DWS Nos. 296-297.

[10] Manget, II, 134-147, Guidonis de Montanor philosophi Galli Scala Philosophorum, opening, "Ut dicit venerabilis Raymundus Lulii." DWS III, 941, however, identifies him with Guido de Monte Rocherii who flourished in 1333.

[11] DWS No. 310.

[12] DWS Nos. 342-343.

[13] DWS Nos. 361, 363, 365.

[14] DWS No. 307. The Index (III, 961) suggests that he was the chronicler of the early 15th century.

[15] Rome, Casanatense 1477, 15th century, fols. 172v-175v: "Ego Nicolaus Yspanus natione dico et affirmo dicta philosophorum oscura . . . / . . . et per istum modum multiplicabitur quantitative et qualitative etc. Explicit brevis tractatus alkimie Nicolai Yspani."

[16] DWS No. 315. See Nos. 303 and 314 for tracts by a Nicholas to whom no other name is given. The Index (III, 970) suggests that he was Nicholas of

Renatus Francigena.[18] But the works of these authors appear to have been for the most part brief and unimportant. Other such names are brother John of Mâcon, Nicholas Faber, Raverius of England, and Raymond de Lastras.[19]

An *Epistle* of master Geraldus de Morangia of Aquitaine seems to contain passages reminiscent of other alchemical writings and hence to be itself of later date. The opening words, "God, lord of science, from whom is every best thing given and every perfect gift . . ." recall the incipits of works attributed to Merlin, John Dastin, James of Siena, and William Sedacerius. The address, "Ad amicum suum," is that of a work sometimes ascribed to Raymond Lull. Gerald has been asked to answer three questions: what is that homogeneous thing which has in itself the natures of all four elements? whether he ever proved this art by experience? how far he has progressed in it?[20]

The same manuscript contains an even briefer work by James or Jacobus de Garandia. It makes little difference when it was written, since it is a short compilation of commonplaces with citation of well known hermetic authors. Its use of the word, chaos, slightly suggests the Lullian alchemical collection.[21]

A Bernard Gama or de Grava et Avernio who composed a

Prussia, a Benedictine who flourished in 1414.

[17] DWS No. 316: and see the Index, III, 974.

[18] DWS No. 313. Possibly the following has reference to the same author: BU 142 (109), 15th century, vol. I, fols. 211r-214v, "Dicta domini Renati. Dicit dominus Renatus . . . / . . . est sententia."

[19] BU 138 (104), 15th century, fols. 197r-206v, "Opus Nicolai Fabri de operatione metallorum. Quia radix . . . / . . . hec dicta sufficiant de metallis"; fols. 227r-232r, "Practica ad lapidem. Recipe primo limature . . . / . . . lapis tuus. Explicit scriptum de libro fratris Iohannis de Matiscone"; fol. 256, "Tractatus de celidonia secundum Raymundum de Lastras. Nota quod quinta essentia . . . / . . . sicut dictum est."

BU 142 (109), 15th century, vol. I, fols. 208r-210v: "Dicta domini Rauerii Angli de lapide philosophorum. Dicit quod subiectum . . . / . . . que est in vase."

[20] BN 11202, 15th century, fols. 163r-170r.

[21] BN 11202, fols. 69v-70v: "Opus magistri Iacobi de Garandia. Et primo incipit ad primam materiam qui dicitur chaos . . . / . . . Et tibi sufficiat de aceto nostro id est de aqua nostra mortificante et vivificante omnia corpora. Explicit opus magistri Iacobi de Garandia." A later hand has crossed out the last three words and scrawled beneath, "Iohannes de Rupaciza."

commentary on the Rosary,[22] or more likely the *Parvus Rosarius* or *Perfect Mastery and Joy* of Arnald of Villanova,[23] was presumably a different person from Bernard of Treves and probably later. Some manuscripts call him Bernard de Gravia.

Some anonymous works, distinguishable by their titles, may also probably be assigned to the fifteenth century, such as the *Soliloquy of Philosophy*[24] or *The Burst of Dawn*.[25] The *Soliloquy* is in two parts containing eight and twenty-three chapters. The latter treatise gives four reasons for its title and then seven parables of which the last is a confabulation of the lover with his beloved. Its second part is in three chapters on astronomy, arithmetic, and the natural process of first doctrine.

Another anonymous writer made a compendium from the fourteenth century alchemical text opening, "Studio namque florenti . . ." which we have discussed in an earlier chapter, and harmonized it with the *Testament* and *Codicil* of the Lullian collection. He therefore probably wrote in the fifteenth century, and we may perhaps accept the date, June 10, 1449, at the close of the treatise as that of its composition rather than copying.[26] If so, the treatise which follows it and is dated at its close,

[22] Vatic. Barb. 273, fol. 258r, lists, "Bernardi de Grava et Avernio super Rosarium magistri Arnaldi de Villanova commentaria," opening, "Ingenio huius mercurialis sublimationis. . . ."

[23] BU 303 (500), 15th century, fols. 1-62r: "Commentum magistri Bernardi de Gama alias de Grava super parvo rosario magistri Arnoldi de Villanova. Ingenium igitur . . . / . . . docet exercitative." See also BU 270 (457), VIII, 4, and XXV, 4.

[24] Vatic. Palat. 1329, 15th century, fols. 21v-37v: "Opus perfecti magisterii quod appellatur soliloquium philosophie maius. Primo de coniugio matrimoniali . . . / . . . philosophorum antiquorum et ad hoc presens sufficiant in capitulo vicesimo tertio. Quare est finis soliloquii."

[25] Vienna 5230, 1505 A.D., fols. 239r-249v: "Incipit Aurora consurgens. Venerunt mihi omnia bona . . . / . . . sanguine menstruali per cursum eius." S. Marco VI, 215 (Valentinelli, XVI, 4), 1475 A.D., fols. 65r-161r: with same title and incipit. The latter part of the work was printed in *Artis auriferae*, I, 185.

[26] BN 14008, fols. 104r-123r, "In nomine domini nostri J. C. inc. Compendium abstractum a textu alkimie videlicet studio florenti una cum intentione testamenti et codicilli R. L. omnia simul concordando. In nomine sancte trinitatis recipe de vitrioli lb. 1 et de aere . . . / . . . omnia opera supradicta ad quod te perducat dei filius qui vivit et regnat deus per omnia sec. sec. amen. Explicit compendium extractum a libro florenti philosophi de magni lapidis compositione et operatione. Deo gratias. 1449 die 10 Iun."

November 3, 1450, may be by the same author. It is entitled *Totum continens* and divides into two books, one of eight and the other of twenty chapters.[27] This division suggests the *Rosarius* of Arnald of Villanova, and a marginal note in another manuscript of the *Totum continens* asserts that it agrees with the *Rosarius* except for a few verbal changes.[28]

In the chapter on Arnald of Villanova we have seen that the author of a treatise called *Gloria mundi* was a Wimandus or Wynandus or Weygandus de Ruffo Clipeo (Rothschild). There are yet other spellings; perhaps Winandus is the simplest form of the name to use. Since he cites the letter of Bernard of Treves to Thomas of Bologna,[29] he must have written after 1385, while

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The divisions of the work are quite different from those of "Studio namque florenti . . ." (for which see Appendix 12), as the following quotations will demonstrate:

Fol. 113v, "Secundus tractatus sequitur de lapide vegetabili qui spiritus quinte essentie nominatur et qui dicitur in omnibus lapidibus lapis et non lapis nec habet naturam lapidis ita est in animalibus et vegetabilibus sicut dictum est in mineralibus. Lapis benedictus philosophicus non potest fieri nec esse sine spiritu quinte essentie. . . ."

Fol. 117v, "Tertius tractatus. Qualiter ex mercurio vegetabili generatur lapis animalis et mineralis. Lapis fit ex vegetabilibus quia ex succis herbarum ana simul coniunctarum postquam steterunt in fimo diebus 12. . . ."

Fol. 119r, "Quartus tractatus sequitur. Qualiter debetur separari et regi quatuor elementa ab omni vegetabili et etiam animali. Modus autem universalis qualiter. . . ."

Fol. 121v, "Quintus tractatus sequitur. De putrefactione rerum et quod ipsa putrefactio est mater omnium rerum in hac arte. Argentum vivum sive mercurius numquam in hac tota. . . ."

[27] BN 14008, fols. 124r-138v, "Incipit liber veridicus de investigatione lapidis philosophici et de perfectione eiusdem qui Totum Continens vocatur. Dividitur autem ista scientia prima divisione in theoricam et practicam. Secundo dividitur in diversa capitula. Dividitur autem tota ista scientia in duas partes principales: in prima investigatur lapidis origo et generatio metallorum, in secunda modus preparandi et operandi declaratur. Capitulum primum huius operis ubi generatio argenti vivi et eius congelatio et sue proprietates nominantur. Omnia liquebilia sunt ex argento vivo et sui sulphuris substantia naturaliter operata . . . / . . . et concedere dignetur J. C. dei benedictus filius qui in trinitate perfecta cum deo patre et spiritu sancto vivit et regnat per omnia sec. sec. amen. Explicit Totum Continens completus die tertia novembris 1450."

See also Lami (1756), p. 265.

[28] BN 7163, fol. 76r, "Incipit Liber Veridicus a philosophis compilatus. Dividitur autem ista scientia prius. . . ." In the top margin is written, "Convenit hic liber cum Rosario magno Arnaldi de Villanova paucis verbis immutatis."

Probably a different work is BU 270, XII, 8: "Veridicus de lapide magno. Scias tres mutationes . . . / . . . et a contrario."

[29] BL Ashmole 1450, fol. 19r.

the widespread existence of the *Gloria mundi* in manuscripts of the fifteenth century which differ considerably in their readings suggests that it was written at the latest early in that century.[30] Once it occurs part in German and part in Latin. The author speaks of himself as a physician, the least of philosophers, and as living inland in the land of the duchy *Francie,* presumably Franconia.[31] In most copies the work begins oracularly and oratorically, stating that its title is Glory of the World, Book of the Sun, Book of Lights, and Book of the Five Keys of Virtues, that among the Greeks it is called *Theologica* or the book of divinity, among the Saracens *Ishmael.* It embodies a triple art: the first method being by Greek names and alphabet, the second by Hebrew names and alphabet, the third a perverted method by Latin names. Conscious of the many errors in previous alchemical literature, Winandus proposes to write nothing which he has not seen with his own eyes, and tested himself experimentally. He will show the hidden treasure which many sages seek, he will reveal the light concealed in shadows, and so on. At the same time he represents his work as extracted from the *Perfectum magisterium,* although whether he means the work of Arnald of Villanova of that title is not evident. Arnald is not named, but Albertus is cited more than once. Senior is likewise cited. We hear little more of the triple linguistic method mentioned in the introduction except that we are told that elixir in Hebrew is the equivalent of ferment in Latin. The treatise is made up of truisms concerning the stone mingled with practical directions, in which use is made of metal plates and drops are produced which appear like the eyes of fish or like pearls. The need of a mean between perfect and imperfect metallic bodies is stressed, and an analogy is drawn between seven stages of whiteness and redness in the process of transmutation and the seven ages of the world. Sometimes the treatise is divided into two books.

[30] For a list of MSS see Appendix 55.

[31] CLM 455, fol. 98r: "Ego Weygandus medicus minimus philosophorum dictus de Ruffo Clipeo directa (*directus? diversus* in Ashmole 1450) ex illa parte aquis distans in terra ducatus Francie."

The name of Winandus is also associated with *Expositions of All Things Mineral* pertaining to the art of alchemy in a manuscript of the fifteenth century at Wolfenbüttel.[32] What is perhaps a third treatise is ascribed to him in a manuscript of the same century at the university of Bologna.[33]

Alchemical works found under the name, Alanus, are difficult to date, but since one of them occurs in the same fifteenth century manuscript with the *Gloria mundi* of Winandus just mentioned, we may broach the problem here. In this manuscript Alanus speaks of himself as "the least of philosophers and alchemists."[34] The text appears to be incomplete since, while there are allusions back to a first book and a second book, and an opening of a third book, no openings of the first and second books are marked. Alanus assures us that the animal stone from putrified basilisk is no fable, for he has tested it experimentally but gave it up because of the danger of losing his sight.[35] The vegetable stone from the juice of the three herbs, lunaria, saporaria, and portulaca, has not yet come to his notice.[36] Apparently this is a different work from the *Dicta Alani philosophi de lapide philosophico*, printed by Zetzner as translated from German into Latin,[37] or the *Dicta Alani* contained in a manuscript of 1444.[38] The printed version has been attributed to Alanus de Insulis who died in 1202 but seems certainly as late as the fourteenth century, favoring the mercury alone theory and citing Rasis, Geber, Calid, Senior, Longanus, Phiares, Alchidonus, and Lucian the philosopher. In a miscellaneous collection of manuscripts dating from

[32] Wolfenbüttel 3168, 15th century, fols. 7r-11v: "Hic incipiunt expositiones omnium rerum mineralium . . . secundum magistrum Wynandum. Sciendum est omnibus indagatoribus . . . / . . . est melius omni naturali. Expliciunt expositiones omnium rerum mineralium."

[33] BU 747 (1492), 15th century, fols. 89v-97v: "Wivandus de ruffo clypeo. Operationes omnes . . . / . . . fructu consecuto."

[34] CLM 455, 15th century, fol. 119v, "Cum causa esset veritatis achimi (*sic*) scire magisterium ego Alanus minimus philosophorum et achimistarum (*sic*). . . ." Whether the text ends at fol. 121v or 122v is uncertain. At fol. 121r we read, "Incipit liber tertius."

[35] *Ibid.*, fol. 120v.

[36] *Ibid.*, fol. 121r.

[37] Zetzner, III (1659), 722-729, "e Germanico idiomate Latine reddita per Justum a Balbian Alostanum."

[38] Wolfenbüttel 676, fol. 218: I have not examined it.

the fifteenth to seventeenth century is a *Practice of Alchemy* in Italian which an Alanus of Bohemia is said to have addressed to Boniface VIII, but this association of names is probably a late fabrication or confusion.[39] In a previous chapter we have spoken of a treatise on the rotation of the elements which is attributed to Alanus in a manuscript of 1475.[40] On the other hand there seems to be no alchemical work ascribed to Alanus in manuscripts before 1500 of the libraries of Great Britain and Ireland.[41]

In another fifteenth century manuscript of the work of Winandus is a *Diadem of Philosophers* and *Secrets of Secrets* which Floranus, a disciple of Aristotle, is said to have written for his cherished son, Cresus. The work defines alchemy and gives various "experiments" but also devotes much space to the signs of the zodiac and operation according to the constellations. It is possibly a fifteenth century fabrication.[42]

In 1412 Amplonius Ratinck composed a catalogue, classified by subjects, of the manuscripts in his large library. Not only has the inventory been preserved, but most of the manuscripts are still in existence at the Stadtbücherei of Erfurt. Although this collection was very rich in medicine and astrology, it included very few alchemical writings, rather less indeed than it has of magic. Amplonius listed only four alchemical codices containing about a score of items.[43] Whether this was due chiefly to lack of interest or faith in the art on his part or may be taken as a sign

[39] FN Palat. 867, XIV, fols. 129r-136r, opening, "Spesso uolte in longo tempo ci siamo parlati. . . ."

[40] See our previous volume, p. 140.

[41] In the index to DWS the only Alanus mentioned is a mercer of London who in 1415 introduced an alchemist named William Morton to the prior of Hatfield: see DWS III, 783.

[42] S. Marco fondo antico 323 (Valentinelli, XVI, 5), fols. 145r-154v: "Incipit tractatus magistri Florani magni philozophi post Aristotelem. Et intitulatur dyadema philosophorum et secreta secretorum. Nam Floranus fuit philosophus certus de genere Aristotelis et ab Aristotele instructus . . ."; at fol. 149v, "Incipiunt secreta secretorum tractatus"; at fol. 154v ends, ". . . Operare ergo omnes secundum constellationem ut prius."

The name Floranus does not appear in the index of DWS.

[43] W. Schum, *Beschreibendes Verzeichniss der Amplonianischen Handschriften-Sammlung zu Erfurt*, Berlin, 1887, p. 817, "Sequitur de alchimia que subalternatur philosophie naturali."

that alchemical manuscripts were difficult to procure before the fifteenth century is perhaps open to dispute. The latest alchemical author cited, with the possible exception of a Mathew, is Arnald of Villanova, although one or two titles, listed without names of authors, may be later than he. The alchemical codices listed by Amplonius have all since disappeared from the collection, which suggests that others possessed interest and faith in the subject and may serve to explain why in general so comparatively few alchemical manuscripts earlier than the fifteenth century have reached us.

In 1430 a certain Louis who was in the service of the duchess of Luxemburg is said to have worked out a *Practica* there with a prior preacher and to have succeeded in combining copper with, or transmuting it into the best silver without any detriment.[44] In the same manuscript of the fifteenth century are brief alchemical tracts attributed to an Anthonius of Florence,[45] who is elsewhere said to have been murdered in Bohemia, a Gratiadei,[46] and a Marchus de Anciso of Rome.[47] These cannot be much later than the middle of the fifteenth century, and although the manuscript includes fourteenth century works such as those of Rupescissa or alchemical tracts ascribed to Aquinas but probably composed considerably later, it seems more likely that those mentioned are relatively recent.

In connection with the afore-mentioned ascription of an alchemical tract to an Anthonius of Florence, it may be noted that St. Antonino, archbishop of Florence (1440-1459), not only

[44] S. Marco fondo antico 323 (Valentinelli, XVI, 5), 15th century, fol. 190v.

[45] *Ibid.*, fol. 166r, "Tractatus Anthonii de Florentia ad Iohannem de Lafnano (these preceding four puzzling words are omitted in Valentinelli's catalogue) magistrum peritissimum de arte philosophie. Recipe cupri unam lb. bene . . .."; fol. 170r, "Sequitur via universalis completa per magistrum Anthonium philosophum peritissimum" (not *Parisiensem* as given by Valentinelli, and the tract does not seem to extend to fol. 183 as he states). Probably John de Lafnano is John von Laaz.

[46] *Ibid.*, fols. 206v-215r: "Practica Gratiadei. Primo fac aquam separationis de vitriolo et sale nitri, post recipe. . . ." Several Graziadei's are listed by Chevalier, chiefly clerics.

[47] *Ibid.*, fol. 273r *et seq.*, "Incipit tractatus alchimie extractus ab omnibus bonis libris repertus et expertus per me dominum Marchum de Ancisio de Roma." It is merely a short collection of recipes.

opposed incantations and several forms of divination but held that transmutation of metals was beyond human power, and that the offendor should make restitution whether he knew that the metal was false or had been deceived in this.[48]

In 1432 on September 20 is dated a *Practica* of the philosophers' stone by a master Baldwin or Balduinus de Rombertis.[49]

A record of the unsuccessful dabbling in alchemy by Barbara, the second wife of the emperor Sigismund, was made by John von Laaz in a manuscript of 1440.[50] This Johann von Laaz has been identified with a John de Lasnioro or Lazionoro by whom an alchemical tract is in print. At its close the year of composition is given as 1448, and John is called a disciple of Antonio of Florence who was murdered in Bohemia by impious men because of his chemical art.[50a] In the text John expresses enthusiasm for the works of Hermes and Thomas Aquinas "and other modern philosophers" but a dislike for "new philosophers who are wont to write, Accipe accipe, quod est decipe et habebis trufam."[50b]

The efforts of the alchemists to separate the elements were accompanied by theoretical discussion of the relation between elements and compounds by the scholastic philosophers and physicians. We have an example of this in a question disputed at

[48] *De eruditione confessorum,* cap. 19: "Si quis fecit alchemiam aut falsificavit monetam quia ultra mortale tenetur ad restitutionem idem si falsis scienter utitur et si in hoc deceptus fuit." On divinations and incantations see caps. 12 and 23.

[49] BU 270 (457), 15th-16th century, vol. VI, 3: "Practica lapidis philosophici anno domini 1432, die 20 Sept. Omnis medicina . . . / . . . suis proprietatibus."

[50] The Latin passage is quoted by Hermann Kopp, *Die Alchemie in älterer und neuerer Zeit,* Heidelberg, 1886, I, 160-161, from the preface by B. N. Petraeus to the 1717 edition of the works of Basilius Valentinus.

[50a] *Tractatus de secretissimo antiquorum philosophorum arcano,* 1611, Tractatus ii; Zetzner, IV (1613), 657-662: "Deus in adiutorium meum intende et aperi intellectum meum . . . / . . . Explicit via universalis Ioannis de Lasnioro Lazon sub anno millesimo quadringentesimo quadragesimo octavo feria sexta in vigilia Viti. Ego vero Ioannes Lucianus exemplavi diligentia magna Anno quadringentesimo [*sic*]. Sit laus almae trinitati et individuae unitati sine fine. Amen.

Hic Ioannes superius subscriptus de Lazionoro fuit discipulus ipsius Antonii Itali de Florentia oriundi qui hic Bohemiae propter eam artem Chymicam ab hominibus impiis est trucidatus prout in Bohemico de lapide philosophorum scripto testatur ita accidisse."

[50b] *Ibid.*, p. 660.

Bologna "by the most subtle doctor of arts and medicine, Hugh of Siena," who died in 1448.[51] His reputation as a learned disputant is illustrated by the story of Aeneas Silvius that at the council of Ferrara he invited the visiting Greeks to a banquet at which he offered to debate with them the points of opposition between Aristotle and Plato. Hugh allowed them to choose either side they pleased and defeated them single-handed. The present disputation at Bologna, contained in a manuscript written in 1440, is concerning the method of generation of mixed bodies from the elements and the permanence of the elements in the mixed bodies. Hugh sets forth four previous views on the question. Thomas del Garbo in his *Summa* contended that mixed bodies can in no way be made from the elements, and that the elements are in no way in compounds, but that mixed bodies have qualities midway in virtue between the qualities of the elements. The second view was common in Hugh's student days and held by Marsiglio (of Sancta Sophia)[52] and many others. It was that mixed bodies can be generated from the elements, but that the substantial forms of the elements do not remain in the compounds, although their qualities do. A third view is that of Averroes, that the elements remain in compounds in a potential but not an actual state. The fourth view is Avicenna's, that the elements are divided into the smallest particles and remitted in their accidental forms and then are joined with others by a form which is superadded.

Guglielmo de Dya, also known as Fabbri or Fabri, a physician of Savoy, in the fifth decade of the fifteenth century wrote a treatise on the philosophers' stone and potable gold. A manuscript copy made at Vienne in Dauphiné in 1476 is preserved in the university library of Bologna[53] and has been described

[51] S. Marco VI, 72 (Valentinelli, XII, 20), 1440 A.D., fols. 153r, col. 2-155r col. 1: "Questio Bononie disputata compendioseque recitata per subtilissimum artium et medicine doctorem Ugonem Senensem. De modo generationis mixtorum ex elementis et elementorum permanentia in mixtis. . . ."

[52] By Marsilio de Sancta Sophia there is a *Questio de elementis* in twelve articles in S. Marco VI, 72, fols. 133r-153r: "Questio est utrum diffinitio elementorum sit bona. . . ."

[53] BU 138 (104), paper folio, fols. 245r-253v, "Incipit liber guylielmi de dya de lapide philosophorum et de auro potabili ad summum pontificem. Gratulanti michi dudum is quem christiani sanctissimum dicebant pro certis per eum collatis michi beneficiis . . . / . . . Explicit opus magistri guyglelmi de dia loquens familiariter ad summum pontificem de possibilitate artis super lapide philosophorum et de virtutibus auri potabilis et de talchem et yxer."

with more fulness than lucidity by Carbonelli.[54] William composed his work in answer to questions put by the antipope Felix V (1440-1449), otherwise known as Amadeus VIII of Savoy, whose physician he was. He states near its close that he wanted to show the pope that *citramontanes* possessed knowledge as well as Italians. A main purpose of the work is to justify alchemy which Fabri attempts to reconcile with the natural philosophy of Aristotle and to show that the art is ethical and moral. After discussing potable gold, Felix V asked Fabri what were the two more secret words of ancient philosophers and prophets. Fabri replied that one of them, Ysar or Yxir (i.e. Elixir), whose meaning is great treasure or vehement fortitude, had already been sufficiently discussed. The other word was written Telchem among the Egyptians and Thesalym or Danayes among other peoples. These words represent two arts. The art of the elixir, or alchemy, is not permitted by the papal chancery, but the leading jurists have approved its premises in general and the majority of theologians agree that it imitates nature. The second art of Talchem or Thelesini is prohibited by human laws and by the Christian faith because of its evil ends and consequences, but great philosophers relate it closely to philosophy and medicine. It appears to be closely related by Fabri to the art of magical or astrological images, since he goes on to cite the work of Thebit ben Chorat, the *Speculum astronomiae* of Albertus Magnus, and the treatise of Arnald of Villanova on seals and the mansions of the moon. The pope appears to be little dismayed by these forbidden arts, for he goes on to inquire as to the books called Almadel and Semafora on the divine work of angels and the notory art of Solomon by which knowledge is suddenly acquired. Fabri replies that they contained unknown names, ob-

[54] Carbonelli, *Sulle fonti storiche della chimica e dell' alchimia in Italia*, Roma, 1925, pp. 84-93. At p. 85 is a facsimile of the first page of William Fabri's treatise.

servation of times, and inspection of figures which theologians held suspect. " 'Vere,' dixit, 'tunc ego non credo quod sit in talibus tanta rubigo ut dicunt,' et surrexit riddens a loco illo." Thus these forbidden arts were lightly dismissed. It was to this same pope, according to Simon de Phares, that Martin of Siena addressed a letter containing astrological predictions.[55]

An alchemical treatise on the secrets of nature which a brother Ermengaud Pinet wrote in July, 1452, was transcribed by John de Lachellis in December, 1476, at Vienne on the Rhone. The original work comprised two books of theory and practice, but our manuscript reproduces only the first book and three lines of the other.[56]

In 1455 an alchemist was involved in a criminal action brought by the commune of Dijon against a local lord, Jean de Bauffremont, seigneur of Mirabeau, Bourbonne, and Soye. This lord had engaged Pierre d'Estaing, a physician of Moulins, born at Valence and in favor with the house of Bourbon, to make gold and had paid him large sums towards this end. When the experiments failed of success, the physician escaped and took refuge with the Dominicans of Dijon. Jean de Bauffremont invaded the cloister and carried him off by force in violation of the right of asylum. The town appealed to the duke of Burgundy, and Jean had to stand trial and was condemned to pay a large fine, while his servants had to make a humiliating public submission. What became of d'Estaing is not stated,[57] but the case should

[55] *Recueil* (1929), p. 252.

[56] BU 138 (104), 1476 A.D., fols. 142-146r: "Quoniam humanus intellectus est valde fatigatus . . . / . . . Explicit liber primus theorice fratris Armingaudi Pineti de secretis nature editus ab ipso M°CCCC°LII° de mense Iulii et transcriptum (*sic*) per me Iohannem de Lachellis M°CCCCLXXVI de mense decembris in civitate Vienne. Liber practice fratris Armengaudi suprascripti de secretis nature editus pro Christi pauperibus sic incipit ut infra. Ne enim per opinionum nebulas animus tuus discurrat. . . ."

Another MS which I have not examined but presume is merely a later copy of the preceding is BU 270 (457), 15th-16th century, vol. XVIII, 3: "Quoniam humanus intellectus . . . / . . . te reddet certiorem. Explicit liber primus Theoricae fratris Armigandi Pineti de secretis naturae editus ab ipso MCDLII de mense Iulii. Et transcriptum (*sic*) per Ioannem delachell 1476 de mense decembris in civitate Viennae."

A third MS is Arezzo 354.

[57] At least not by Jules Marion, "Procès criminel intenté à Jean de Bauffremont par la commune de Dijon pour violation du droit d'asile dans la personne d'un alchimiste," *Bibliothèque de l'école des chartes*, VII (1845-1846), 254-270.

have at least tended to insure the right of asylum to other alchemists.

In 1456 Mr. Robert Frunitor or Barkar of Bongeye, Suffolk, composed a short alchemical treatise in the English language as the sun entered Scorpion in November two days after its true conjunction with the moon. Thus for once we have an alchemical work dated with astronomical precision.[58] In 1459 Nicolaus de Walssee copied several alchemical treatises.[59]

Someone has recorded in a manuscript of the fifteenth century[60] that in 1460 or 1466[61] an alchemical recipe called "Augment of the Sun" of margrave John of pious memory was given him[62] on the vigil of Stanislaus by Nicolaus de Barth, doctor of arts and medicine and physician of the same margrave. Another recipe he had from a doctor of medicine of Nürnberg which had been given to the margrave by the apothecary, Stephanus of Nürnberg. Possibly this was the margrave of Baden to whom an alchemical recipe is ascribed in another manuscript of the fifteenth century.[63]

Peter de Rossellis was licentiate in canon law, and bachelor of medicine, also perpetual vicar of St. John de Mercato in the city of Valencia. On July 21, 1462, he completed writing, in a neat hand with large illuminated initials for the openings of treatises and chapters, and red and blue capitals scattered through the text, a manuscript comprising Latin works of Geber and other alchemical treatises: Aristotle to Alexander, Arisley, James of Siena, Alphidius, Hermes, Arnald of Villanova to the king of Naples, Rosinus to Eustatia, and a treatise on waters in which Ortolanus is cited, second tractate, eleventh chapter.

[58] The MS, BM Stowe 1070, 15th century, fols. 26-32, is described in DWS No. 312. I cannot agree with DWS III, 980, that he is Robert Perscrutator.

[59] Vienna 5509, fols. 205r, 249r, 254v.

[60] S. Marco fondo antico 323 (Valentinelli, XVI, 5), fol. 183r.

[61] Valentinelli reads the figures as 1466 which is possible but less likely to my eye than 1460.

[62] "Datum mihi in civitate cubitensi."

[63] DWS No. 358.

Most, if not all, of these works were composed before the fifteenth century.[64]

Jacques Foulon was a Premonstratensian abbot at Amiens in the fifteenth century who was given to alchemy and made annotations on the writings of Albertus Magnus. Foulon died in 1488.[65]

Not content apparently with alchemical epistles from Arnald of Villanova to Boniface VIII and from John Dastin to John XXII or from Arnald and Raymond Lull to kings of Aragon, Naples, and England, someone tried to bring such correspondence more up to date and to combine pope and secular ruler in a single missive. We therefore have a letter which Cosimo de' Medici is supposed to have written with his own hand to pope Pius II (1458-1464). It is already found in a collection copied in 1475,[66] showing that such forgeries did not take long to spring up. Past authorities cited are Aristotle and Avicenna, Albertus Magnus. *Turba philosophorum,* Geber, John of Rupescissa, and Raymond Lull.[67] Probably a more recent alchemist is named in Peter Fangena.[68] The first operation to be performed is sublimation, as the first step to reduce things to first matter, called by the philosophers *aqua permanens.* Quicksilver must be purified by sublimation with sulphur, and not with extraneous substances like orpiment and arsenic. The most holy father is advised to take water of gold and place it without division of the elements in a spherical glass vessel so that it may circulate and be reduced to the true fifth essence and finally converted into the elixir. The author advises against first dividing the elements on

[64] Naples XV.F.54, fol. 109r, "Fuit completum presens volumen per me scriptum Petrum de Rossellis licentiatum in decretis bacallarium in medicina necnon vicarium perpetuum sancti Iohannis de mercato civitatis Valencie vicesima prima mensis Iulii anno domini nostri Ihesu Christi millesimo quadringentesimo sexagesimo secundo, Deo gratias."

[65] Louis François Daire, *Tableau historique des sciences, des belles-lettres, et des arts dans la province de Picardie . . . jusqu'en 1752,* Paris, 1768, p. 130.

[66] S. Marco VI, 215 (Valentinelli, XVI, 4), fols. 258v-261r: "Sanctissimo patri in Christo. Quod in binas litteras . . . / . . . Vale domine alme et parce latinitati non assueto in erroribus."

[67] *Ibid.,* fol. 260r, "Rupasis in libro lucis et Raymundus."

[68] *Idem,* "Quod vas vitreum cum vitro calido sigilla sigillo Hermetis prout exponit Petrus Fangena."

the ground that they are already so perfectly conjoined and proportioned in gold that this condition cannot be improved upon. The vase is to cook for 170 days continuously over a slow fire until the contents turn successively black, red, yellow, green, the color of a peacock, and to that whitest appearance which indicates the elixir for silver. The fire is then augmented and the elixir for gold is finally obtained. The author states that he has given instructions as to the fuel of the fire in previous letters. The process of projection is performed with one part to a thousand, and a single drop of the elixir has wonderful medicinal properties. But if composed from mercury and sulphur instead of from water of gold, it would be corrosive and poisonous. The author illustrates this point by the case of an Alexander Tarentinus in his time at Florence who dropped dead while removing from the glass vessel a "medicine" which he said was the elixir of metals and life. Later on the same day his servant, Arnelius, who tried to control this "medicine" also died, and finally it was buried in old sewers to get rid of it. "Cosimo" then closes with a request that the humanist pope pardon any errors in his Latin, a language to which he is unaccustomed.

An experiment with Saturn or lead, performed at Avignon by master Antonius Francigena, is the first of a half page full of alchemical recipes and is dated on October 16, 1464, in a manuscript written over a century later.[69] There may be some connection between this Antonius Francigena and the Renatus Francigena mentioned above.

As Cuno of Falckenstein had received alchemical treatises from John Dombelay or Bumbeles towards the end of the fourteenth century, so his successors in the archiepiscopal see of Trier continued to be devoted to alchemy during the fifteenth century. When Cuno retired in 1388, to die the year following, he left a vast treasure, but his nephew and successor, Werner or Wernherus, lessened it by hiring many alchemists and purchasing many books on the Hermetic art. There was a belief, how-

[69] S. Marco fondo antico 325 (Valentinelli, XVI, 6), 1575 A.D., fol. 72v (not 82, as stated by Valentinelli).

ever, that he had secreted large amounts of gold and silver. John, the fourth archbishop after Werner, vainly dug and searched for this hoard, and also for thirteen years employed an alchemist from Croatia who finally fled. This George of Croatia was also employed by Eberhard, the duke of Wurtemberg. Archbishop John was reported to have wasted 30,000 florins on the art, but he denied this in Trithemius's presence, blushing violently the while. His chamberlain, a citizen of Cologne named Henry, lost his entire fortune in the pursuit of alchemy and then deserted wife and children and had not been heard from since. Trithemius further mentions an abbot in Saxony whose devotion to the art left his monastery deep in debt, and other clergy who sought after the philosophers' stone—another abbot near Bamberg, a Carthusian prior of Nürnberg, and Melchior, bishop of Brixen in Bavaria.[70] There is extant in manuscript an alchemical *Practica* ascribed to Conrad, archbishop of Prag.[71]

To Trithemius himself was ascribed a brief alchemical tract, presumably spurious, while Gerhard Dorn made alchemical use of the passage quoting the Emerald Tablet of Hermes in Trithemius' letter of August 24, 1505, to Germanus de Gonay.[72]

In January, 1472, and December, 1475, respectively two long alchemical miscellanies or collections were completed in Foligno at the instance and petition of a master of arts and medicine named Butius Gemininus or Gemuinus or Genurinus or Generinus de Ferrantis of Perugia. The earlier was written by a master Peter Grignolus de Ponto Canapitii,[73] the later by master Theodoric Ghysibertus de Lunenburg of Saxony.[74] Butius was thereby equipped with an alchemical library of some sixty odd treatises.

According to Carbonelli, Christopher of Paris wrote on December 24, 1470, extolling the city of Venice and its rulers for

[70] Trithemius, *Chronicon Hirsaug.*, II, 286-288.

[71] DWS No. 308.

[72] Zetzner, IV (1613), 663-665, Chemicus nobilis Ioannis Trithemii, opening, "Omnis philosophiae naturalis consultissimi viri decreverunt . . ."; Zetzner, I (1613), 420-432, from Dorn, *De naturae luce physica,* 1583, pp. 135-158.

[73] S. Marco VI, 214, fol. 303.

[74] S. Marco VI, 215, fol. 297v.

the liberty with which one could study and practice alchemy there.[75] As a matter of fact, the Venetian government had only two years before issued a decree severely condemning any practice of alchemy and threatening professional alchemists, whom it stigmatized as pseudo-savants and charlatans.[76] On turning to Christopher's own text, however, we find that Carbonelli has misinterpreted his utterance. At the close of his *Summa minor,* which he writes, or is represented as writing, in Italian from Paris because he is not yet expert in "grammatical science" (i.e. Latin), he merely expresses his affectionate regard for the most illustrious and most glorious signoria of Venice because it has ever defended the name of Jesus Christ, our blessed Lord, and because of the many other virtues of its governing fathers.[77] Which language may be interpreted either as an attempt to soften the heart of the Venetian government by flattery or as a bit of sarcastic bravado.

Christopher of Paris was an eclectic popularizer of past alchemical literature in Latin especially of the fourteenth and fifteenth centuries. But while he cites the *Turba,* Arnald of Villanova, Ortulanus, and others, his favorite authority is the

[75] Giov. Carbonelli, *Sulle fonti storiche della chimica e dell' alchimia in Italia,* Rome, 1925, p. viii, "e Cristoforo Parisiense scriveva in data 24 dicembre 1470 esaltando la città di Venezia ed i suoi reggitori per la libertà colla quale si poteva studiare e praticare l'alchimia."

[76] Alessandro Massalongo, "Benedetti e la medicina veneta del quattrocento," *Atti R. Istituto Veneto,* 76 (1916), 211: "Il Veneto Governo, con Decreto del 1468, severamente condannava qualunque procedimento alchimistico e minacciava severe pene contro gli alchimisti di professione, che giudicava falsi sapienti, o meglio truffatori."

In the *Voarchadumia* of Ioannes Augustinus Pantheus, Venice, 1530, however, the date of the decree is given as December 17, 1488: "Pars consilii Decemvirorum Venetorum 1488 17 Decembris cum additione incipiente, 'Tollenda sunt de medio . . .' "

[77] Pavia Univ. 341, fol. 22r: ". . . cioe acostandovi alla illustrissima et gloriosissima signoria di Venetia alla quale in verità sono molto affettionato et amo quella cordialissimamente poiche quella d'ogn'hora ha difensato el nome di Y X^{to} sig^{r} nostro benedetto et per alcune altre virtú che vivono in molti di quelli padri governatori prudentissimi di quella excellente et gloriosa republicha ex Parisio 24 die Xbris 1470. Explicuit summa minor excellentissimi philosophi ac theologi magistri Christofori Parisiensis de compositione magni lapidis ad laudem et gloriam omnipotentis Dei et Patris nostri Y. X^{ti} et gloriosissime semper virginis matris eius, Amen. alphabetum quod hic desideratur quere eum sub tali signo * fol. 26 retro."

pseudo-Raymond Lull. He quotes various works of the Lullian collection at length in his *Elucidarius,* imitates its pious opening sentences, and employs the alphabets and phraseology of the Lullian alchemy freely. It seems odd that a Parisian should write regularly in Italian, and we wonder if the whole thing is not a hoax. Christopher according to his own account had been at Rome, however. He tells of the discovery during his residence or visit there of an ancient lead casket containing a glass vase in which a perfume still preserved its fragrance, which he regards as due to "aurific vegetability" or the virtue of the fifth essence.[78] Christopher's alchemical writings include in addition to the *Lucidario* or *Summa maggiore* and *La somma minore* or *Summetta,* a *Medulla della Summetta,* a *Cithara* or *Violetta,* an *Alfabeto apertoriale,* and various letters.[79] He also seems to have composed a *Philosophical Tree* in Lullian style and certain alchemical recipes or *Particularia.*[80]

The *Cithara* is a short tract. After praising God for his wondrous love and gift of his Son, it gives some extracts "from our greater *Summa,*" and avers that there are many false philosophers who are cruel deceivers. A lady then appears to Christopher and other allegorical paraphernalia are introduced. "Our Raymond" is quoted; we are advised not to cast pearls before swine; Geber and Hermes are cited; a *figliolo* is often addressed; and Christopher announces his intention of stating only such things as are useful in practice. He then, however, devotes most

[78] Zetzner, VI (1661), 211 and 219.

[79] See a list of his writings in FN II, iii, 25 (Magliabech. XI, 22; XVI, 66), 15th-16th century, fol. 177r. The text of the *Lucidario* follows at fols. 179r-200r, a copy made in 1520.

[80] The bibliography in Vatic. Barb. 273 attributes the following works to Christopher of Paris: fol. 262r, Lucidario sive summa maggiore, opening, "Misericordias domini in eternum cantabo . . ."; De arbore philosophico, opening, "Secondo la universale sententia . . ."; La somma minore, opening, "Fiolo carissimo adi ultimo settis . . ."; La cittaro o' violetta, "Se l'eccelso et glorioso dio . . ."; Alffabeto Apertoriale, opening, "Carissimo fiolo, respondo a vostre littere . . ."; and another opening, "Piglia d'ottimo A. de vino negro . . ."; fol. 263v, Particulare repertum in scripturis quondam domini Andree Ogniben eius discipuli, opening, "Recipe vitrioli bene sicci . . ."; fol. 297r, Lapis vegetabilis ut habetur in Apertorio eius Alphabetico, opening, "Accipe aque benedicte optime rectificate. . . ."

of his remaining space to five impediments to alchemical achievement; namely, presumption, poverty, vainglory, trying to hurry Nature, and taking the advice of other alchemists too much. The treatise is dated from Paris on September 12, 1474.

The *Summa minor* or *Summetta* is addressed to Andrea Ognibene who is represented as Christopher's disciple. It opens with an account of Christopher's going into a monastery and two venerable matrons who were his relations being grieved at his sensuality and St. Francis appearing to him in a vision and encouraging him to pursue the study and practice of alchemy.[81]

Three letters, dated in 1470, 1473, and 1476, or in 1473, 1476, and 1478, are extant written by Christopher of Paris in the name of Andrea Ognibene to Christopher de Recaneto, professor at Padua, dealing with certain doubts as to the art.[82] It was this Christopher de Recaneto who commented upon the *Calculationes* of Suiseth in thirty-two lectures.[83] He taught philosophy at Padua from 1460 to 1465, medicine after 1467, and died in 1488.

During the same decade in which Christopher of Paris wrote, George Ripley, born in Yorkshire and a canon of Bridlington, composed some of his chief alchemical works.[84] In 1470 he dedicated *The Compound of Alchemy,* or book of the twelve gates, to Edward IV, and in 1476 the *Medulla alchimiae* to George Neville, archbishop of York. Like Christopher he was a popu-

[81] Florence, Riccard. 2581, 15th century, paper, neatly written, with registers or tables of contents of the component treatises: fol. 1r, "Tabula de la rubriche de la Summetta cioe Violetta circa le opere minerale." This might seem to indicate that the *Summetta* and *Violetta* were the same work, but actually the text of the *Summetta* occupies fols. 3v-37r, "Explicit Summetta"; while the text of the *Violetta* follows, "Sequitur Violetta," at fols. 37r-62v. Last comes the *Lucidarius,* fols. 63r-150r, ". . . ex auctentico fideliter exempletis (?) anno ab incarnatione domini 1489 die 18 octobris." Its Registrum follows at fols. 150r-156r. *Summula, Cithara,* and *Lucidarium* are again found together in Vienna 5510, 1505 A.D., fols. 129r-149v, 150r-170v, and 170v-223v.

[82] FN II.iii.25, fols. 44r, 51r, and 56r.

[83] S. Marco VI, 149 (Valentinelli, XI, 23), fols. 31r-49: "Incipiunt recollecte super calculationes sub magistro Christophoro de Recaneto huius artis principe die sabati mensis novembris MCCCCLXVIIII in festo sancte Catharine. Lectiones triginta due. Circa primam lectionem sciendum primo quod iste liber sua principia. . . ."

[84] On Ripley there is an article by Robert Steele in DNB.

larizer of the alchemical doctrines ascribed to Raymond Lull, but his poems are in general a rehash of previous alchemical commonplace. Most of his works may be found in English in Elias Ashmole's *Theatrum chemicum britannicum* of 1652, or in Latin in an edition of Cassel, 1649, while the *Twelve Gates* was printed by Zetzner in his *Theatrum chemicum,* and the *Medulla* had appeared at Frankfurt in 1614. There also are numerous manuscripts of Ripley's works, although few seem to antedate the sixteenth century.[85] Sometimes the same treatise has been given different titles. Thus the *Cantilena* also is found as "Of the Philosophers' Stone or The Phoenix."[86] I must say that I have found Ripley very stupid and tiresome reading. *The Ordinall of Alchimy* of Thomas Norton of Bristol, with its criticism of certain alchemists as well as its exposition of the art, is somewhat livelier.[87] But in general, alchemical style and thought is not made more palatable or digestible by being diluted and disarranged in middle English verse. Of all Ripley's pieces his *Vision* is both the most picturesque and also commendably brief and so may be quoted here *in extenso* as a sample of his style and content.[88]

[85] In England there is only an excerpt from the *Philorcium alkimistarum* and an *Aqua vitae* which may not be by Ripley in MSS before 1500: see DWS Nos. 323 and 324. But there are numerous later MSS in the Ashmole collection at Oxford and some in the Sloane collection of the British Museum. At Cassel Landesbibl. Chem. Quarto 66, 67, and 68 contain the *Liber de mercurio et lapide philosophorum, Medulla philosophorum,* and two copies of *Duodecim portarum liber.* BU 138 (104), an alchemical miscellany transcribed at Vienne in 1476 A.D., has at fol. 60, "Consolatio pauperum Georgii Ryplae Angli canonici," while BU 142 (109), 15th century, vol. II, contains his epistle to king Edward, the prologue to his Twelve Gates, Philorcium, Medulla, Pupilla, and Tractatus de terra terrarum. BU 270 (457), 15th-16th century, XXIII, fol. 144r, is the *Medulla alchimae.* At Paris BN nouveau fonds 14012, 1585 A.D., contains several works by Ripley, and BN 12993, 16th century, fols. 1r-33r, is the *Twelve Gates.* Wiesbaden 65, containing 21 items, is 18th century.

[86] See BL Ashmole 1394, II, 17th century, paper, pp. 67-74 and 75-82.

[87] A facsimile from Elias Ashmole's *Theatrum chemicum britannicum* of it, with an introduction by E. J. Holmyard, was published in London, 1928. See also M. Nierenstein and P. F. Chapman, "Enquiry into the Authorship of the Ordinall of Alchimy," *Isis,* XVIII (1932), 290-321.

[88] Quoted from Ashmole's *Theatrum,* London, 1652, p. 374.

When busie at my booke I was upon a certeine night,
This Vision here exprest appear'd unto my dimmed sight,
A *Toade* full rudde I saw did drinke the juce of grapes so fast,
Till over charged with the broth, his bowells all to brast;
And after that from poysoned bulke he cast his venome fell,
For greif and paine whereof his Members all began to swell,
With drops of poysoned sweate approaching thus his secret Den,
His cave with blasts of fumous ayre he all be-whyted then;
And from the which in space a golden humour did ensue,
Whose falling drops from high did staine the soile with ruddy hew:
And when this Corps the force of vitall breath began to lacke,
This dying *Toade* became forthwith like Coale for colour blacke:
Thus drowned in his proper veynes of poysoned flood,
For tearme of eightie dayes and fowre he rotting stood:
By tryall then this venome to expell I did desire,
For which I did committ his carkase to a gentle fire:
Which done, a wonder to the sight, but more to be rehear'st,
The *Toade* with Colours rare through every side was pear'st,
And White appeared when all the sundry hewes were past,
Which after being tincted Rudde, for evermore did last.
Then of the venome handled thus a medicine I did make;
Which venome kills and saveth such as venome chance to take.
Glory be to him the graunter of such secret wayes,
Dominion, and Honour, both with Worship, and with Prayse.
AMEN.

Alberto Bruni, who was born at Asti in 1467 and gained the doctorate in 1496, almost takes us beyond our proper period but may be included for the sake of interesting personal reminiscences anent alchemists and alchemy in his treatise on the increase and diminution of money.[89] After citing most of the earlier legal authorities whom we have mentioned in the chapter on John XXII and the occult arts, Albert waxes more sceptical and remarks concerning Arnald of Villanova's gold rods, "And he made in that science one pound which has impoverished a

[89] Manget, I, 213, col. 2-214, col. 1, Ex Alberto Bruno in tractatu augmenti et diminutionis monetae, in 1 praesuppositione num. 13 et 14: verified from the Venice, 1584, edition, p. 208, col. 1, in vol. XII, *De fisco* of *Tractatus universi iuris.*

thousand men either because it was not true or because it is not understood." Albert then tells of a former law partner or friend of his who "sweat much at that art." Albert wished to see an experiment of the best he could do, and accordingly his colleague in his presence reduced one ounce of the purest silver to the semblance of gold in weight, fusion, and malleability, except that the color was not yellow but leaden. However, his colleague had a process for giving it a yellow color. "And that substance endured and sustained some tests but not the extreme test, and admixed with a like amount of precious gold it seemed gold of twenty carats more or less according as that substance was better disposed." Albert apparently was not over impressed by this feat of alchemy but he states that a certain great prelate and many alchemists of long standing marvelled much at the experiment. One old alchemist thought he could grow rich by reducing that substance to the true species of gold but he failed. Thinking that the art must be illusory, if so many men in forty or fifty years had not seen an attempt as notable as his friend's experiment, which was an illusory experiment at that, Bruni did not care to see another.

Sceptical, too, was Angelo of Chivasso (died in 1495) in his *Summa angelica* concerning cases of conscience.[90] He was apparently almost the only jurist of the fourteenth or fifteenth century who would condemn all alchemical activity alike. After citing the previous authorities he states that despite their opinions he believes the art illicit because no one has ever been found who has the true art, although many are said to have it, and because most alchemists waste their time and resources, and work in secret and shun the light. If they sometimes make a little true gold, it is accomplished at a loss after the expenses are computed, or else there is some deception or deceit of the devil involved. Their exercise of the art he deems contrary to the

[90] *Summa angelica de casibus conscientiae,* Chivasso, 1486, and many other editions. But that of Venice, 1476 (Panzer, III, 111, 255; DWS III, 794-795) is rejected by GW 1923 as mythical. Extract in Manget, I, 214, cols. 1-2, "Sequitur contraria disputatio Angeli in summa in verbo alchemia."

public welfare, since they squander wealth and often make counterfeit money, and so he condemns them without exception.[91]

Jerome Zanettini (Hieronymus de Zanetinis) was professor of civil law at Bologna from 1458, of canon law from 1469 to 1473, when he went to the university of Pisa. He died in 1493. He replied to the argument of Angelo and preferred to side with the majority view, contending that the art of alchemy itself was not illicit simply because no one had as yet attained full success in it.[92]

"Excerpts from the books of master John Hermann of Viterbo" are found in an alchemical manuscript of 1507-1508.[93] It would seem likely that this John Hermann wrote before 1500.

According to Pavanello there died at Rome in 1494 in decrepit old age, after having taught at Padua and Rome, Andrea Brenta who had collected the opinions of various philosophers on the philosophers' stone.[94] In this Pavanello appears simply to have copied de Renzi except that he miscopied the date of death which de Renzi gave as 1484.[95] De Renzi gave no source for his statement but appears to have confused Andrea Brenta with an Andreas Brentzius who over a century later in 1606 dedicated *Variae philosophorum sententiae perveniendi ad lapidem benedictum* to Wolfgang, bishop of Regensburg.[96] Caraffa in his account of Andreas Brenta says nothing of such a work and makes Brenta die in 1485—or possibly 1484 is meant—in the prime of life (*florente aetate,* not in *età decrepita*).[97] His printed works seem to have been chiefly translations of Hippocrates. In that of *De insomniis,* addressing pope Sixtus IV, he raised the question whether dreams forecast the future. I am not certain if he is the same Brentius whose untimely death

[91] *Idem,* "Ideo simpliciter sunt condemnandi eam facientes."

[92] Manget, I, 214-215, "Conclusio ex Hieronymo de Zanetinis qua disputationi et argumentis Angeli responditur in c.l. Ex. de accusat." This had been previously published in Zetzner, *Theatrum chemicum,* IV (1659), 247 *et seq.*

[93] CLM 26059, fols. 81-85.

[94] G. Pavanello, *Un maestro del quattrocento, Giovanni Aurelio Augurello,* 1905, p. 61.

[95] Salvatore de Renzi, *Storia della medicina italiana,* Naples, 1845-1848, II, 320.

[96] Zetzner, IV (1613), 372-409.

[97] G. Caraffa, *De gymnasio romano et eius professoribus,* 1751, II, 306.

while still a "iuvenis" was lamented by Augurellus in a poem addressed to Thomas Leonicus and printed in 1491.[98] Augurellus of course was to write a celebrated poem on alchemy, his *Chrysopoeia,* but it belongs to the sixteenth century.[99]

[98] Ad illustrissimum principem Pandulfum Malatestam . . . carminum liber primus, Verona, 1491, cii verso-ciii verso.

[99] To the information given above at p. 333, note 2, concerning Antonius de Abbatia may be added the following from Vatic. Barb. 273: fol. 242v, Antonii ab Abbatia, Epistola prima de lapide philosophorum, "Quia philosophi plura scripserunt et dixerunt . . ."; fol. 243r, Epistola secunda de opere rubeo, "Quamvis in precedenti epistola vobis de hac . . ."

CHAPTER LIV

CONRAD HEINGARTER OF ZURICH AS AN ASTROLOGER

Conrad Heingarter[1] was one of the leading exponents of astrology and medicine and their combination north of the Alps in the second half of the fifteenth century. He is also known as Thurecensis from his citizenship at Zurich and was called a German by the contemporary French astrologer, Simon de Phares, who states that he "was my master for three years."[2] Indeed, in one of his own writings our author styles himself, "Conrad Heingarter a German born in Zurich."[3] He had, however, received his B.A. in 1454, his M.A. in 1455, and the licentiate in medicine at the university of Paris on March 29, 1465 (1466),[4] and was connected with the court of John II, duke of Bourbon, and with Louis XI of France. It was at the former court that Simon de Phares was associated with him in the years around 1470,[5] but his labors for Louis XI had also begun by that time, if Simon de Phares is correct[6] in informing us that Conrad in 1469 composed a treatise for Louis on the

[1] Since he seems to have been of German extraction, this is the more probable spelling of his name, although it has looked like Hemgarter in some manuscripts of his works which I have examined, and is so spelled in the notice of BN 7432 in the old printed catalogue of the manuscripts of the royal library. Chéreau, "Les médecins de Louis XI," *Union médicale,* XV (1862), 340, spells it Hermengaster.

[2] For Simon's references to Conrad see pp. 256 and 264 of his *Recueil des plus celebres astrologues et quelques hommes doctes,* ed. Ernest Wickersheimer, Paris, 1929.

[3] BN 7450, fol. 21v, "ego Conradus Heingarter alemanus oriundus de Zurich." Or *alemanus* may mean Swabian.

According to Wickersheimer, *Les médecins de la nation anglaise (ou allemande) de l'université de Paris,* 1913, p. 37, he was born at Horgen.

[4] Wickersheimer (1913), p. 37.

[5] The date is fixed by Simon's stating that he was there at the time of the birth of Charles VIII, to whom he writes, at Amboise. I know of no authority for Chéreau's statement that Conrad had been attached to the court of Charles the Bold before Louis XI enticed him away.

[6] Just before, Simon has said that Conrad predicted many things for the duke of Bourbon, "and then was given a large stipend by king Louis."

conjunction of Saturn and Mars which occurred on August second at eleven hours and seven minutes in the fifth degree of Taurus. Simon describes Conrad as "excelling in philosophy, a very learned and expert doctor of medicine, a subtle and profound astrologer," in fact, "the most profound of his time in the science of the stars." For twenty-five years he made precise and truthful annual predictions, and we rather get the impression that he was still living when Simon wrote in 1498.[7]

Several compositions are extant by this Conrad Heingarter, both astrological and medical in character.[8] Most of them have not been printed but are preserved in manuscripts of the Bibliothèque Nationale at Paris. We may first mention them in what seems to be their chronological order and then take them up more topically. The treatise which Simon de Phares mentions on the conjunction of Saturn and Mars is not extant so far as I know, but from that same year 1469 we have another work by Conrad, an exposition of the nativity of Jehan de la Gutte, an official at the court of the duke of Bourbon and born on August twelfth, 1418.[9] The fact that Conrad writes the nativity from Paris[10] rather than within the territories of the duke of Bourbon tends to bear out Simon de Phares' statement that in 1469 Conrad discussed the aforesaid conjunction for king Louis XI, although that monarch of course spent much of his time elsewhere than at the capital. But Conrad's opening words show that he had previously held a position at the Bourbon court, from which he had apparently absented himself on leave or vacation. In a later work written in 1477, Conrad states that he has been

[7] Since Simon does not mention his death or use any such adjective as "the late" in speaking of him, and once uses the perfect rather than pluperfect tense in regard to him: "Cestui, quasi chacun an, par l'espasse de 25 ans a fait prenosticacions moult precizes et fulciez de verité. . . ." But twenty-five years from the prediction of 1469 would bring us down only to 1494.

[8] For tables of contents of them see Appendix 56.

[9] BN 7446, fols. 1r-14r, "Nativitas N. anno M° CCCC° XVIII currente XII augusti. Cum nuper ab officio quod in curia illustrissimi nostri principis borbonii ducis prestare soleo vacarem, retuli me ad studia litterarum. . . ."

[10] As its closing words show: *ibid.*, fol. 14r, ". . . Suscipe ergo bono animo et vale et omnes qui te vale desiderant. Per tuum Conradum Heingarter ex Parisius anno M° cccc° lxix currente xv februarii."

nearly fourteen years in the service of the duke of Bourbon, that is, since about 1463 or 1464.[11] This nativity of Jehan de la Gutte is followed in the same manuscript by astrological and medical advice addressed to the same person,[12] based upon his nativity, and written at some time subsequent to its composition, perhaps within the same year, but more likely later on, since Conrad speaks as if considerable time had elapsed since he treated of John's nativity.[13] He was still in the employ of the duke of Bourbon but now was writing at Belle-Perche,[14] not, however, the place of that name near Montauban, but his residence in the duchy of Bourbon as a later passage will show.

Jehan de la Gutte appears to have been somewhat the senior of our astrologer who refers to him as "preceptor"[15] and "father,"[16] and states that "you cherish and love me as if I were your son."[17] Jehan's nativity shows that he was born on August twelfth, 1418, and was therefore fifty-one years of age when Conrad drew up his nativity.

The comet of 1472 elicited a disquisition upon comets in general and it in particular which seems to be the only treatise by Heingarter in print. It was printed at Beromünster by Helias Heliae at some time after April, 1472,[18] which is the latest date referred to in the work itself, and again in 1474 by Hans Aurl.[19] The author is referred to simply as "a physician of Zurich,"

[11] BN 11232, fol. 1v, "Cum tamen tredecimus et prope quartusdecimus annus agatur michi curiam tuam amplissimam tuamque frugalissimam domum expeto."

[12] BN 7446, fols. 15r-33v, opening, "Divum Platonem (pater optime) eum qui primus divitis mentis philosophus est appellatus preclare dicere solitum scribit Cicero, 'Unumquemque mortalium non sibi soli natum esse. . . .' "

[13] *Ibid.*, fol. 16r, where in beginning the first chapter he says: "In nativitatis tue figura (quam speciali quodam libello tibi iamdudum descripsimus). . . ."

[14] *Ibid.*, fol. 15v, "ad que studiosius exequenda sepenumero litterarum otium apud bellam particam mihi navandum indulget suscepisse videar"; fol. 33v, "per litterarum otium apud bellam particam mihi concessum."

[15] BN 7446, fol. 14r, "amice preceptorque peroptime."

[16] *Ibid.*, fols. 29r, 30r, 30v, 33v, "pater optime."

[17] *Ibid.*, fol. 1r, "Cum igitur non aliter quam filium me plurimum et diligas et ames."

[18] *Catalogue of Books Printed in the XVth Century Now in the British Museum*, III, 799. Hain 15512. Copies in the Pierpont Morgan library and BM IB. 38108.

[19] Copies are BM IA. 20402 and, bound with a MS, Vatican 9018, fols. 43r-74r. I cite the latter.

but would seem to be our Conrad Heingarter, although the work has been claimed for others. The text conforms to his usual practice in other works of not giving a table of contents until after a preliminary paragraph or two of text.[20] Where the treatise was composed is not revealed, some allusions to the effect of the comet upon the pope being scarcely sufficient to place it at Rome. It was later, however, translated into Italian.[21]

At the close of the treatise on the comet of 1472 Heingarter explains that he does not attempt to make predictions as to particular events, persons, and places, but only to note the general effects of the comet. On the whole he interprets its influence as good in contradistinction to those who represented comets as always signs of evil and disaster. Like most of his contemporaries, Conrad believed with Aristotle that comets were not heavenly bodies but generated from the earth by the action of the stars. He made Saturn the chief influence in this, but stated that it was Mars which caused the comets to fly in air. He did not, however, agree with the opinion that the tail of the comet of 1472 moved with a movement like that of Mars in its epicycle. Indeed, he was inclined to doubt if any of the planets had an epicycle.[22] Conrad went so far as to call one of his contemporaries, with whose opinion as to the present comet he disagreed, "a son of presumption." Much of his discussion of the comet is astronomical rather than astrological, dealing with its size, length, and distance from the earth.

If we do not have the prediction which Conrad made for Louis XI from the conjunction of 1469, we do possess an annual prediction for the year 1476 which he drew up for that monarch.[23]

[20] The incipit of the work is, "Dixit Aristoteles. Nemo eorum que ignorat bonus est iudex . . ." For suggestion of other authors than Heingarter see Wickersheimer (1913), pp. 41-42.

[21] Berne B 55, 16th century, paper, fols. 1r-33r, Libro nel qual' si tratta delle comete composto gia circa settanta anni passati ma adesso nuovamente fuor' mandato del Thuracese medico fisico huomo dottissimo; 33v-86r, Delle cometa che l'anno 1472 appariva.

[22] BM IB 38108, fol. 8v; Vatic. 9018, fol. 63v; "Et forsan nullus planetarum epiciclum habet quod magis putandum opinor."

[23] BN 7450, paper, 15th century, fols. 3r-21v. "Iudicium anni millesimi quadringentesimi septuagesimi sexti currentis. Prefatio. Quom curialibus laboribus et negociis familiaribus aut omnino aut magna ex parte aliquando liberatus retuli me, rex christianissime, ad ea studia astrologie que retenta animo remissa temporibus longo intervallo intermissa castigatione varia revocari. . . ." The work ends: " . . . Et in hoc finitur sexta pars. *Conclusio totius.* Has pronostications, rex christianissime, tue regie maiestatis fidelis servitor ego conradus heingarter alemanus oriundus de zurich ex sapientum documentis magna cum diligentia collegi. Supplicans eidem tue regie maiestati ut eas ea animi benignitate qua me ipsum suscipere consuevit accipiat. deus eandem tuam regiam maiestatem diutissime in omni prosperitate conservet."

He speaks as if he had given no attention to astrology for a long time previous, but possibly the interval seemed longer to him than it actually was. This work, like the second of the treatises written for Jehan de la Gutte, was probably composed at what seems to have been Heingarter's favorite retreat for study and literary composition, his "citadel" or castle of Belle-Perche, since in noting how far off a Ptolemaic observation is now he reduces it for verification to longitude of twenty-three and a quarter degrees, reckoned apparently eastward from Ptolemy's prime meridian of the Fortunate Islands or Canaries,[24] and latitude of forty-six and a half degrees, to the horizon of Belle-Perche.[25]

In the next year, 1477, Heingarter addressed to John, duke of Bourbon, a work on the state of his health,[26] which he finished

[24] This agrees roughly with the longitude east of 23° 45′ given for Paris (Sedes regis Francorum) in the Marseilles Tables and in most early Latin versions of the Toledo Tables, whereas in manuscripts of the fourteenth century and later of the Toledo Tables Paris is more often placed over forty degrees in longitude east. This, as J. K. Wright—"Latitudes and Longitudes in the Middle Ages," *Isis,* V (1923), 75-98, see especially pp. 85-91—has explained, was because the Arabic writers, and medieval Latin astronomers after them, realized that Ptolemy had exaggerated the length of the Mediterranean Sea (62° instead of 42°). Hence the Fortunate Islands were not so far west as had been supposed and a new prime meridian was adopted to replace them, some 40 degrees instead of some 20 degrees west of Paris. But Heingarter with his admiration for Ptolemy appears to have reverted to the earlier method of indicating longitude, thereby offering another example of the scientific retrogression which often accompanied the classical Renaissance.

[25] BN 7450, fol. 3r, "Hoc mihi ad nostra tempora atque ad nostrum clyma sextum, ad longitudinem 23 graduum cum quarto unius, ad latitudinem vero 46 graduum et semis, ad orizontem arcis bellepartice verificandum putavi." BN 7432, fol. 4r, "ad orizontem arcis bellepartice cuius longitudo est 23 gradus cum 15 minutis, latitudo vero 46 et semis."

[26] BN 11232, 55 fols., but the pages are small. It opens, "Vellem nunc, dux Bourbonis Iohannes inclite, michi ab immortali deo dari facultatem ut tibi bonam tui corporis valitudinem scientiis conservare et amissam recuperare et

on October thirteenth.[27] Like most of his literary compositions, it was written while absent from court.[28] The manuscript of this treatise which is preserved in the Bibliothèque Nationale, Paris, was presented in 1520 to Conrad's son, Augustus, by his physician, Joseph Ronselli.[29] A nativity of the duke of Bourbon by Conrad Heingarter does not seem to be extant, but there is a horoscope of him by Antonio Chiapucini in a manuscript of the fifteenth century at Lyons.[30]

It does not seem possible to date in any given year the last work by Conrad Heingarter which we have to note, namely, a commentary on the *Quadripartitum* of Ptolemy, of which there are two manuscripts in the Bibliothèque Nationale, Paris.[31] These manuscripts are not textually identical, however, but represent two different versions, one of which is probably to be regarded as a later and revised edition of the other. They have

debitum tue compositioni vite terminum prolongare possem. . . ." The text proper opens at fol. 3r, "Mundanorum mutationes variationes atque alterationes de sano in egro et econtra de egro in sanum propter motum supercelestium corporum nobis accidunt, princeps excellentissime. . . ."

[27] *Ibid.*, fol. 55r, "Vale ducum decus optimum et valeant qui tuam dominationem valere desiderant. Finit 1477° die 13° mensis octobris."

[28] *Ibid.*, fol. 54v, "Conclusio operis. Hec sunt, princeps excellentissime, que ego Conradus Heingarter tuo potissimum nomine eo tempore quo a tua curia absens fui edidi. . . ."

[29] *Ibid.*, fol. 55r, in a different hand from the text is added: "Ego Iosephus Ronselli phisicus eius magistro Augusto filio illius domini Conradi anno a Virginis partu 1520."

[30] Lyon 233 (formerly 165), terminated in 1484, or at least at some time between 1483 and the duke's death in 1488, 24 fols. "Ad illustrissimum et excellentissimum dominum Ioannem Bourboni et Alvernie ducem semper invictum Antonius Chiapucini prenosticationes et calculationes super nativitate et intronicatione. Nichil est, illustrissime princeps, mortalibus nobis tam fructiferum. . . ."

[31] BN 7432, fols. 36-125v, and BN 7305 (formerly Colbert 2037 and Regius 3436; also bearing the name, "Jac. Aug. Thuanis"), fols. 4r-346r. In BN 7432 (formerly Colbert 6089, Regius 6033), fol. 1r contains brief lives of Ptolemy and Hermes. These are evidently by Heingarter since they contain allusions to his favorite retreat, Belle-Perche, and to the "era of John, duke of Bourbon and Auvergne." Moreover, in the *Advice* to the duke of Bourbon Ptolemy is eulogized with the same phrases as are used in this *Vita*. At fols. 1v-3r, is a table of contents for the *Quadripartitum* ("Distinctio quadripartiti per capitula et amphorismos") and of the other treatises in the manuscript which fill fols. 126-264. In BN 7305 some excerpts from Haly follow at the close of Heingarter's commentary to fol. 353r, where Conrad gives specimens of nativities and revolutions.

this in common, that both are addressed to John, duke of Bourbon,[32] and aim to spread his fame and that of his castle of Belle-Perche.[33] But the preface to the duke is not the same in these two versions.[34] There is a more fundamental distinction between them than this. What appears to be the older and more neatly-written manuscript gives only one text for the Latin translation of Ptolemy's *Quadripartitum*.[35] It occupies the center of the page: Heingarter's commentary is written about it in the margin in a slightly smaller handwriting. In the second manuscript, on the other hand, two different Latin translations of the *Quadripartitum*, of which one is identical with that in the other manuscript, are given together, a sentence at a time, followed in a smaller hand but in the same single-columned text by the commentary, which in its turn departs somewhat from the wording

[32] In BN 7305, fol. 4r, the work is headed, above the initial letter of the preface, "Ad illustrissimum Iohannem Borbonii atque Alvernie ducem Conradi Heingarter Thuricensis doctoris medici et astrologi In quadripartiti Ptholomei commentarios prefatio." The duke is again named and saluted at the close of each of the four books and in opening the third book: *ibid.*, fols. 74v, 185v, 186r, 287v, 345r. Whether this is the case in the other manuscript I have not determined. It lacks the initial rubric or titulus naming him, but its preface contains a eulogy of him as a protector of learning: BN 7432, fol. 4r, ". . . et ad eram Iohannis Borbonii atque Arvernie ducis illustrissimi, verificare dignum putavi. Nam ipse est princeps qui, nostro tempore, fere solus in Europa scientias diligit, amat atque observat, et scientes honorat, qui, a finibus terre per mundi universa climata, omnium gentium et linguarum scientias perquirit, et libros de sapientum antiquorum sententiis perditos, inemendatos, restaurari emendarique jussit; quibus hodie illuminantur viventium intellectus, et futurorum posteritas, procul dubio, illuminabitur. His igitur, mi domine, contentus sis, quia, quando aliorum regum et principum fama liquescet, tua fama cunctis temporibus immortalis vigebit."

[33] BN 7305, fol. 346r, "Habes, excellentissime princeps, commentaria que ego Conradus Heingarter in omnibus tuus ad tui nominis laudem atque tue arcis Bellepartite famam. . . ." BN 7432, fol. 125v, "Hec sunt commentaria, excellentissime princeps que ego Conradus Heingarter ad tui nominis laudem atque tue arcis Bellipertice famam. . . ."

[34] In BN 7432, fol. 3v, it opens, "Deus illum vere diligit in quo posuit superioris scientie intellectum que procul dubio est scientia astrorum. . . ." In BN 7305, fol. 4r, it opens, "Eam fauste gubernari rem publicam, inclite dux, docta illa prisce vetustatis asserit achademia. . . ."

[35] It begins in BN 7432 on fol. 5r which has an illuminated border and a picture of Ptolemy, astrolabe in hand standing on the sphere of earth with birds, clouds, and stars circling about his head. The commentary in this case is relegated to the opposite page, fol. 4v, but usually it surrounds the text.

in the other manuscript.[36] The later of the two manuscripts and versions at first seems definitely dated, since at the close of its second, third, and fourth books respectively we find the dates: September 26, 1493; November 4, 1493, at the third hour; and November 20, 1493, at the ninth hour; while supplementary matter at the end of the manuscript is also dated November 22, 1493.[37] These punctilious datings, so written as to stand out on the page and catch the reader's eye, suggest the astrologer's stress on times and seasons. They are not paralleled in the other manuscript, but the great difficulty is that John II, duke of Bourbon, died at Moulins in 1488 without legitimate heirs, and that the duke in 1493 was Pierre II (1488-1503). Either, therefore, we must regard these datings as an officious and rather unusually elaborate recording of the termination of various sections of his labors by a later copyist, which seems a little improbable, since the time elapsed is that appropriate for composition rather than for transcription; or we may conjecture that an earlier year has been incorrectly copied as 1493. The year 1453 would be the most apt to be so misconstrued because of the resemblance of the old figure for five to the later nine, and the text refers to the fall of Constantinople. But according to Conrad's own statement, he did not enter the service of the duke of Bourbon until about 1463. And while the fall of Constantinople is alluded to as recent, enough time has elapsed since it for the duke to order a library. Perhaps, therefore, some date in Roman numerals has been incorrectly transcribed as 1493.

Conrad commented upon the *Quadripartitum* of Ptolemy as an astrological work of the first importance but as obscure and requiring exposition. He would, however, have been satisfied with the earlier commentary of Haly but for the fact that lazy copyists had allowed its text to become very corrupt. It is Haly that he especially strives to follow, "since no one before him ex-

[36] In BN 7432, the commentary opens at fol. 3v, "Scientiarum quedam sunt sine opere . . .": while in BN 7305, it opens at fol. 6r, "Stellarum iudicium (quam astrologiam vocant) est scientia a principiis certis proveniens. . . ."

[37] BN 7305, fols. 185v, 287v, 346r.

pláined the obscure opinions of Ptolemy with such clarity."[38]

Heingarter has great admiration for Ptolemy and puts him first among astrological authorities. "In all sciences and especially those of the *quadrivium* and above all in judicial astrology he was very intelligent and published many most noble works." He was born in Alexandria and verified the positions of the stars there in Hadrian's time. Conrad praises his eloquence, love of truth, high spirit and perseverance, hard study, and light diet. "He died in his seventy-eighth year. He was absolutely the leader in this divine science."[39] His positions for the stars were now incorrect, Conrad granted, and required revision, but his astrological rules were proved most true by reason and experience, and not to be compared with those of Hermes, Albumasar, or any other doctor.[40] In the treatise to Louis XI[41] Heingarter objects to the practice of many astrologers of basing their principles on the entry of the sun into Aries or another sign—as indeed we have often seen them do in other chapters—which he regards as absurd, without reason, and contrary to the doctrine of Ptolemy.

Heingarter's writings seem of importance in four chief respects. First, as specimens of the astrology, and possibly other occult science or superstition of the period. Second, for the light they throw upon the history of medicine and medical literature. Third, for such bits of miscellaneous information as they may

[38] BN 7305, fol. 5v: "Quem ante nos Hali doctissimus philosophus exactissime interpretatus est, cuius commentariis contenti fuissemus nisi transcriptorum inertia plerique omnes eius loci depravati fuissent. Volui tamen pro viribus ipsum insequi eo quod nullus ante eum tanta claritate obscuras Ptholomei sententias enucleavit."

[39] BN 11232, fol. 6r: "Ptholomeus in omnibus scientiis et precipue in quadrivialibus et quam maxime in astrorum iudiciis valde fuit intelligens et libros quam plures nobilissimos edidit. Natus fuit in Alexandria maiori ibidemque tempore regis Adriani stellarum verificationes fecit. Hic fuit boni et dulcis eloquii vere dilectionis ire fortis et durabilis multum in studio laboriosus parum commedebat obiit anno octavo et septuagesimo sue etatis. Hic divine scientie simpliciter dux. . . ." This passage opens with the same sentence as the *De vita ptholomei* in BN 7432, fol. 1r, except that it has "in astrorum iudiciis" where the *Vita* reads "in astrologia." The rest of the passage is made up of further phrases from the *Vita*.

[40] BN 7450 fol. 3v.

[41] BN 7450, fol. 5r.

afford concerning the scientific views and general learning of their period. Fourth, for their vivid picture of private relationships and individual personalities of the fifteenth century. We shall not, however, be able to keep these points entirely separate in our consideration.

First we may remark one or two peculiarities of Conrad as a writer. He has a certain tendency to be humanistic and classical in style, citation, and allusion; more especially in his prefaces or introductions addressed to magnates, less so in the text proper. He continues to cite medieval medical and scientific writers with respect. He also occasionally indulges in the medieval practice of Latin punning, as in the line, "Legere enim et non intelligere negligere est." He furthermore is the first and only medieval writer to my knowledge to employ parentheses marks, which he does extensively. They will be reproduced in punctuating the Latin in the footnotes.

There is nothing very startling or unusual about the astrology of Conrad Heingarter or the treatises which he wrote upon the subject. These, as we have seen, were compositions of the common sort and illustrate the ordinary astrological activity of the time, when the drawing up of personal horoscopes and nativities, prognostications from comets and conjunctions of the planets, annual predictions for the coming year, commentaries on the works of standard astrological authorities, and treatises on astrological medicine were frequent and expected publications.

Heingarter shows a tendency in most of his works to engage in argument in the defense of astrology in general or of astrological medicine in particular. Indeed, he has a way of repeating a few standard citations or quotations in favor of astrology over and over. This solicitude to defend astrology implies that there was a considerable opposition to it or scepticism concerning it, but whether more than earlier in the century or than in the fourteenth century is not easy to determine. In his treatise on comets Heingarter states that among those who teach "doctrines and disciplines" the opinion has gathered strength and has been communicated to the common crowd that it is rash and superstitious to believe that the configurations of the stars and apparitions of comets are the causes of wars, alliances, sects, change in laws or religion, and other matters coming under free will, "for they cannot deny that they are the causes of natural effects, daily experience continually teaching the man in the street more than the philosophers of our time."[42]

At the beginning of his work of 1477 to the duke of Bourbon Conrad quotes authorities in favor of astrology for some five pages and says that he would adduce many other testimonies of the philosophers to prove that inferiors are ruled by the celestial bodies, did he not wish to be brief.[43] Among his authorities are Aristotle in the *Meteorology* and *Generation and Corruption,* Cicero on the force of the sun, Rasis on pains in the joints, Bernard Gordon "of modern medical men the most skilful in his *Prognostics,*" Arnald of Villanova, Hippocrates in his *Prognostics* and his book on the judgments of the stars,[44] Ptolemy, and Albertus Magnus in his *Speculum.* This and other passages[45] show that Conrad had no doubt that Albertus Magnus was the author of the *Speculum astronomiae.* Heingarter then again refers to those who would disparage "this art of judgments of the stars." He regards such persons as "ignorant of nature's secrets and crude boors." Very likely with caustic tongues they will have much to say against this chapter of his, "which we have taken from none but authoritative sources," but he is willing to let them bark as much as they will so long as they do not bite him. They object that it is rash and superstitious for a doctor to consult the stars, since medicine is a science resting on

[42] BM IB 38108, fol. 1r; Vatic. 9018, fol. 43r-v: "Sed quia in pluribus doctrinas ac disciplinas (*bisciplinas* in Vatic. 9018) docentibus oppinio invaluit communitatique vulgi inducta est superstitiosum ac temerarium esse credendum astrorum configurationes apparitionesque cometarum esse causas guerrarum amicitiarum sectarum alterationum legum aliorum quoque libero arbitrio subiacere debentium, naturalium enim effectuum esse causas negare non possunt quottidiana experientia vulgus magis quam nostri temporis philosophos continue edocente. . . ."

[43] BN 11232, fol. 4r: "Multa alia testimonia philosophorum ad probandum inferiora regi a supercelestibus adducerem sed brevis esse volo, ideo obmitto."

[44] The Pseudo-Hippocrates on the influence of the moon in the signs.

[45] BN 11232, fol. 51v, etc.

principles of its own. This last Conrad does not deny, but he holds that, as in ethics the virtues are connected, so medicine cannot be separated from natural philosophy or from astronomy.[46]

In the treatise of astrological and medical advice to Jehan de la Gutte Heingarter replies to those who accuse astrologers of making many inconsistent and contrary predictions. His defense is that human life is infinitely varied, that many different things may happen to a single individual in any year, day, or hour, and that there are as many signs in the stars as there are accidents here below.[47] As for conflicting predictions, do not joys and sorrows often come simultaneously, and even joy and death occur at the same instant? Valerius Maximus (IX, 12) tells of mothers who died of joy on seeing their sons return safe after the disaster of Lake Trasimene; Sophocles died of delight when his tragedy won the prize; and Philemon passed away laughing at his own joke on seeing an ass eat figs. On the other hand, the mute athlete Aglessannus learned to speak in his indignation at the attempt to deprive him of his prize, and Jason recovered from an incurable complaint as a result of an attempt upon his life. It will be noted that all these examples are classical, and one wonders whether Conrad has industriously collected them himself or has simply taken them *en bloc* from some ancient

[46] *Ibid.*, fol. 6v: "Huius autem artis iudiciorum astrorum obtrectatores nature secretorum inscii rudes et agrestes mordaci sua lingua forsan multum contra hoc capitulum (quod nisi ex fontibus sapientium hausimus) garrulabunt, quos latrare sinam quoad volent dum me non mordeant. Latrant namque temerarium atque superstitiosum esse medico inspicere in iudiciis astrorum, cum medicina sit scientia fundata per propria principia. At id latrando me non mordent. Nam cum de illis principiis quidquam definio nolo negare propria medicine principia sed volo dicere, quemadmodum ut in ethicis probatum est quod virtutes sunt connexe pariformiter, medicina nec a philosophia naturali nec ab astronomia subtrahi potest."

[47] BN 7446. Of the total argument, which runs from fol. 17v to fol. 18v, we may quote a passage at fol. 18r: "Ne vero predictorum significatorum suarumque significationum multivariam diversitatem subdubites aut eorundem confusa influentia quodammodo turberis, eius rei exempla quedam non vulgaria subiungam quo et tu nec primus nec ultimus ad eam conditionem natus videare, et multorum ineptis insulsisque obtrectationibus a me hoc loco sit aliquantisper responsum qui illoto (ut aiunt) ore astrologos repugnantia sibi atque contraria sepenumero hominibus predicere calumniantur."

writer, or possibly through the medium of some Arabic astrologer such as Albumasar, whom he has cited in connection with the main argument. Moreover, while the infinite variety of life may excuse conflicting predictions, it would seem to increase the uncertainty of astrology. Conrad fails to take cognizance of this possibility. Elsewhere he affirms that the judging of the stars, which they call astrology, is a science issuing from certain principles.[48]

In the *Judgment for the Year 1476* addressed to Louis XI Heingarter again argues on behalf of astrology at the beginning of the work. Many, who attempt to make judgments without science, because of their fallacious operations conclude that astrology is false and render it contemptible.[49] Conrad meets the hostile argument that the mind is not under the stars with the usual reply that it is inclined in conformity with the *complexio* of the body. Therefore an expert astrologer can judge concerning the inclination of the mind, though not of its action, and what is more, he can do so with greater certainty than medical men and natural philosophers.[50] In the nativity of Jehan de la Gutte Conrad refers without qualification to the impression made by the constellations at the time of his birth, "naturally upon your soul and upon your body."[51] In the treatise on comets he again states that the mind follows the body, and that at times when the virtue of the stars is applied with great force, and comets are consequently formed, "human thoughts, estimations, affections, delights, and judgments are all affected thereby." Hence such events as wars take place.[52] Conrad, indeed, goes farther and affirms that it is "not superstitious or rash"—his stock wording—to believe that the configuration of the stars and comets

[48] BN 7305, fol. 6r: "Stellarum iudicium (quam astrologiam vocant) est scientia a principiis certis proveniens."

[49] BN 7450, fol. 3r.

[50] *Ibid.*, fol. 5r: "Ex his patet solutio questionis quod astrologus de anime inclinatione et non de actu (si expertus fuerit) iudicare (certius quam medici et naturales philosophi iudicant) poterit. Nunc ergo ad celestes causas hoc in anno influentes descendamus."

[51] BN 7446, fol. 1v, "necnon de his que ex illa celi dispositione in tuam animam et in tuum corpus naturaliter impressa sunt tam de bono quam de malo."

[52] Vatic. 9018, fol. 53r; BM IB 38108, fol. 5r.

are signs and efficient causes of changes in laws, sects, and other things subject to free will. An able orator and shrewd politician who knows how to read men's minds and move the populace, if he also understands the influence of the stars upon human inclinations and is skilled in the science of images, can persuade men by his oratory, predictions, and prodigies that he is a prophet, start a new religion, and perhaps even procure his own deification.[53] Later, Conrad notes that one astrologer interpreted the comet of 1472 as menacing the pope, while another, perhaps desiring to flatter, had exempted the supreme pontiff after his enthronement from control by the stars. This notion Conrad spurns, declaring that when "our lord Jesus Christ" was unwilling to be made an exception from that law of nature which the Father inscribed in the heavens, a mere mortal is not to be exempted from the divine will which the astrologer can foreknow conjecturally from the stars.[54]

Two or three further illustrations may be given of the things predicted in Conrad's *Judgment* for 1476. Women will quarrel with their husbands and will be disobedient to them, and many men will separate from their wives.[55] This would certainly be a safe enough prediction for the year 1935; perhaps in 1476 it seemed more sensational. In another passage Conrad forecasts prices for the spring months. Saturn's being in mid sky indicates that grain will go up in price, also lead, iron, black stones, magnets, elephants, camels, swine, bears, ostriches, eagles, crows and all black birds, every vegetable whose nature (*complexio*) is cold and dry and every stiptic vegetable and coarse bread. But all things subject to the planet Mercury will be cheap. The great elevation of Mars in its eccentric, on the other hand, indicates that things subject to it will rise greatly in price during the spring quarter.[56] Early in March there will be a great war: about

[53] Vatic. 9018, fols. 55r-56r; BM IB 38108, fols. 5v-6r.

[54] Vatic. 9018, fol. 64r; BM IB 38108, fol. 9r: "Dominus enim noster Ihesus Christus a lege nature quam in celestibus pater conscripserat excipi nolebat. Non ergo excipiendus est homo a divina voluntate quam coniecturaliter astrologus ex astris prescire potest."

[55] BN 7450, fol. 10v.

[56] *Ibid.*, fol. 10r-v.

March twentieth deceptive offers of peace will be made: but about April twentieth the evil will return and many wars will be renewed the world over.[57]

Heingarter has something to say of the inhabited part of the world and of zones and climes in two of his treatises, that on the year 1476 and the commentary on Ptolemy's *Quadripartitum*. In the former he accepts Ptolemy's statement that the habitable land is towards the north. The south is not inhabited on account of the opposition of the aux of the sun, whose propinquity causes excessive heat and drought.

> And the sun burns the peoples dwelling between the equinoctial line and the circle of Cancer, and their bodies are black and thin and their hair curly. They are of a hot nature and have for the most part wild customs and are called Ethiopes.[58]

Their habitations are not continuous because of the great heat, and the same is true of the Ethiopiani—as Conrad calls the inhabitants of the polar region—on account of the intense cold.[59] In the commentary Conrad questions why huge animals like elephants are generated in hot countries when, according to his previous line of argument, they should rather be generated in cold lands. The answer is that huge beasts require intense heat to open their pores. Some say that there are cannibals in the extreme north and south with corrupt and shameful faces. Hermes states in the *Book of Latitude* that in the extreme north and south live wicked spirits and devils and beasts which injure men.[60]

In connection with the seven climes into which Ptolemy divided the habitable world, Heingarter remarks the effect of climate upon the intellect and points out that Aristotle and Galen were of the fifth clime, Ptolemy and Pliny (*sic*) of the third, while Albertus Magnus, "a man most skilled in every science," was born in the sixth clime in upper Germany near the head of the Danube.[61] Thus he ranks Albertus with the great past leaders

[57] BN 7450, fol. 6r.

[58] *Ibid.*, fol. 9r.

[59] See also BN 7305, fol. 101r.

[60] BN 7305, fol. 100r-v.

[61] BN 7305, fol. 101v.

of scientific thought. There are, however, in Europe kingdoms, regions, and cities with other signs and planets ruling them than those of their respective climes. This is either because of the religion they hold, or the date of building their cities, or the nativities of their kings and princes.[62]

Conrad was favorable to the employment of astronomical images in medicine. Albertus Magnus, both in his work on minerals[63] and in the *Speculum astronomiae,* is cited for their use, as is Haly's commentary on the *Centiloquium.* Moses is represented as skilled in astronomy and the maker by this art of two images of oblivion and memory,[64]—a legend to which we have heard Oresme take exception. Aristotle, Thebit ben Corat, William of England, and Arnald of Villanova are other authorities cited for images by Conrad. Particular images and seals of the two last-named authors are repeated in detail. That of William is "to heal the human body and give it health and to destroy injuries and the works of those who are hostile to it, and to convert melancholy thoughts into joy." The image is to be of Venus with further observation of the ascendent, moon, lord of the eighth house, and Mercury. Either an image is to be made of silver to carry with one as an amulet, or a seal is to be made to seal the proper medicines with. Conrad suggests that it will be better for the duke of Bourbon to take Jupiter in place of Venus and to make the image or seal of lead.[65] Arnald's seal is to be constructed with the sun in Pisces and fortunate. On its face should be an image of a fish surrounded by the legend, "Michael Sanctus Matthias," while on the obverse is to be written "agletos" surrounded by the legend, "He who believeth in me, though he were dead, yet shall he live." "Sun, moon, and lord of the ascendent should be fortunate, and Pisces should be rising as you make the seal."[66] It is beneficial for gout and other ills of the feet, cancer, fistula, and so on.

Conrad's attitude is less favorable to ligatures and suspensions

[62] BN 7450, fol. 7r.
[63] BN 11232, fol. 52r, "Mineral. II, iii, 3."
[64] *Ibid.,* fol. 53v.
[65] *Ibid.,* fol. 53r-v.
[66] *Ibid.,* fols. 53v-54r.

or to occult virtue of parts of animals[67] than to astrological medicine. If he lists a few such remedies for gout as taking a live frog in the name of the patient when neither sun nor moon is above the earth, cutting off the frog's hind legs, and binding them in deerskin on the corresponding right and left feet of the patient, from Kiranides, Rasis, Funeus, and Tortor,[68] he seems to take the whole passage from Gilbert of England, even to repeating his statement that he has little inclination for such methods, but that it is well to include them to round out his treatment of the subject and not omit what the ancients have written.

[67] BN 11232, fol. 54v.
[68] In the printed edition of Gilbert's *Compendium medicinae* of Lyons, 1510, the names of these authorities are spelled Funeius and Torror. See *Magic and Experimental Science,* II, 482.

CHAPTER LV

CONRAD HEINGARTER AS A PHYSICIAN

Heingarter not only believes that it is the function of a perfect physician to adapt the influence of the stars to the *complexio* of the patient, but, in view of the years of special study which he has devoted to the subject, he feels that he may without arrogance or false modesty regard himself as a specialist and authority in this field.[1] It cuts across and involves a knowledge and acceptance of the various departments of astrology. Thus the nativity of the patient must be regarded, for when any planet at the time of any man's nativity is in the eighth house, it will be the *significator* of death, and the man will die from some infirmity attributable to that planet. Similarly, if at the time of birth a planet is in the sixth house which is the house of infirmities, then the man will suffer from the diseases which share the nature of that planet.[2] The horoscope of Jehan de la Gutte is used to determine his *complexio* and to lay down thirteen rules as to times and constellations in and under which he should beware of doing or beginning certain actions.[3] Chronological tables are also drawn up, beginning from his nativity on August 12, 1418, and covering one hundred and twenty years to 1537 A.D., as an astrological guide to him what to do and to avoid each year. Incidentally it may be noted that he is not only thus flattered by the prospect of a long life, but the years are numbered from 1 to 120 as of the "Era of Jehan de la Gutte."[4] Dates are similarly reduced to the era of the duke of Bourbon in the

[1] BN 7446, fol. 23r: "Nec arroganter hoc a me dictum existimari velim. Nam medicandi particulam alteram (et eam quidem pro radice inferiore infimam) concedens multis, quod est perfecti medici proprium stellarum influentiam complexioni adaptare, si id mihi assumo, videor id meo iure quodammodo vendicare, quoniam in eo studio (astrologico videlicet: que pars est maxima medicine) etatem plurimam consumpsi."

[2] BN 11232, fol. 16r, end of cap. 6.

[3] BN 7446, fol. 16r, *et seq.*

[4] *Ibid.*, fol. 18v.

works addressed to him. So much for the first part of the treatise to Jehan de la Gutte, which is devoted to prescience of the future. Also in the second medical part we find such a remark as this. "But in the use of solutives do you observe the rules stated below which with the greatest care I have drawn up from the constellation of your nativity as to the medicines which you should take."[5] Eight astrological rules follow.

It is the opinion of many of the most famous physicians that inveterate and hereditary arthritis cannot be completely cured. Conrad, however, cites Yarcosophos the Greek (an author unknown to me, but perhaps the name is simply a misspelling for Wise Healer, *Iatrosophos*) most skilled in medicine and judgments of the stars, who in his second book holds that if this complaint is not understood or cured it is because physicians do not know their patients' nativities.[6]

Observation of present constellations is also essential in medical activities. First Mars, then the moon, then Saturn with the tail of the dragon signify the duke of Bourbon's illnesses. When any one of them is unfavorable in the revolutions of his years or months, he should watch out and take especial care of himself. The signs of the zodiac which are good or bad for him are also indicated.[7] For instance, if the physician wishes to purge the patient of cholera, he should compound and administer the medicine when Mars is in a sign in which its influence is evil, such as Cancer, Libra, and Taurus. If this is impossible, at least the moon should be in one of these signs.[8] One must also know the relation of medicines to the signs and planets.[9] For election of the proper time or constellation Conrad gives seven rules.[10]

[5] *Ibid.*, fol. 31r, cap. 6: "Sed in solutivorum usu subdescriptas observa regulas quas summo studio ex nativitatis tue constellatione medicinis a te sumendis adaptavi."

[6] BN 11232, fol. 13r-v, cap. 6. *Yarcosophos grecus* is cited again at fols. 27r, 28r (for moderation in food and drink), 31r (on baths), 38v (on use of narcotics).

[7] BN 11232, fols. 7v-8r, cap. 3.

[8] BN 11232, fol. 16v.

[9] *Ibid.*, fol. 18v. Already at fol. 8r the duke had been told: "Cum autem aliquod membrum confortare volueris (illud a te non spernatur) ponas iuvantes fortes et nocentes debiles in confectione atque amministratione medicine ut postea suo capitulo proprio dicemus."

[10] *Ibid.*, fol. 19v: "Nota quod in omni electione medicinali sunt septem consideranda."

First one must regard the *almuter* of the nativity, which in the duke of Bourbon's case is Mercury. Second, the lord of the last conjunction.[11] Third, the degree of the ascendent and its lord. Fourth, the degree of sun and moon. Fifth, the degree of the zenith. Sixth, the house and planet signifying the thing in question and the receiver of that planet. Seventh, the part of fortune and the fourth house which signifies the end of the thing.

Conrad then passes to rules for phlebotomy. Dog days and the *antecaniculares* should be avoided, and one should not touch a member with steel when the moon is in the sign of that member. "And take care to weaken the force of that planet whose humor you wish to extract by bleeding." Thus Saturn should be so situated as to have a weak influence, if a patient suffering from quartan fever is to be bled. "For if you did otherwise, the melancholy would be retained, and good blood would be lost. And I have seen and known of many cases of death as a result of this mistake."[12]

It is often advisable for men who are excessively fat, like Jehan de la Gutte, to take medicines which purge their systems of phlegm, but no mean intelligence is required in administering these. For laxatives frequently work great harm, since they are all poisonous and injure the stomach woefully unless they are tempered by a friendly influence of the heavens.[13] Whereupon Conrad cites in favor of astrological medicine Rasis, Bernard Gordon, and Galen quoting the Egyptian astrologers.[14]

[11] *Idem*, "Secundum aptare dominum coniunctionis vel preventionis proxime preterite."

[12] BN 11232, fol. 20r: "Et nota quod planete cuius humorem per sanguinem extrahere vis debilitetur, ut si alicui quartanam habentem flebothomiam ordinaveris, tunc Saturnum debilita. Nam si aliter faceres melancholiam stringeret et sanguis bonus exiret. Et ex illo errore ego vidi et cognovi plures mori."

[13] BN 7446, fol. 31r, cap. 6: "Quoniam expedit sepe homines pingues accipere medicinas fleumatis purgativas, non mediocris intelligentia in earum sumptione est adhibenda. Quoniam medicine laxative frequenter magna inducunt nocumenta eo quod omnes sunt venenose et nocent stomacho mirabiliter nisi amica temperentur celi influentia."

[14] *Idem*, "Et medicorum ille princeps summus Galienus hoc idem vult dicens, Rem certam que non fallit attendat medicus quam docuerunt astrologi Egyptiorum: Quod per coniunctionem corporis lunaris cum stellis fortunatis fiunt egritudines terminabiles ad bonum, et cum contrariis contrarie."

Exercise is praised in general for over two pages[15] as a means of preserving health in the advice to Jehan de la Gutte, although no specific recommendations are made, probably because of his obesity. Nor are the benefits of exercise made dependent on the constellations; apparently it is as beneficial at one time as another. "Exercise therefore," we read, "is one of the nobler and better treatments for the human body in regulation of health and prolongation of life."[16]

In eating, two things are especially to be avoided. The first is imperfect mastication of the food. What did nature give us teeth for? asks Conrad. The second mistake is having many courses at one meal, especially if they are rich (?) and sumptuous.[17] For this Conrad gives several reasons which sound sensible enough. The appetite is sooner satisfied by one dish. A mixture does not digest so well as simple food, because one thing digests faster than another. Many courses lead to too much drinking. The time between the courses has a bad effect, since the crude condition of the last course eaten delays and impedes the digestion of the previous course which has already begun.[18] Heingarter recognizes that Jehan de la Gutte is tempted to indulge his appetite at court banquets.[19] He suggests that digestion will be facilitated by eating softening foods first, such as cabbage or pea soup, porridge of herbs, borrage, baked apples, brown bread, prunes, sweet cherries, figs, grapes, and the like. Secondly, he advises him to eat food which has little nourishment for its quantity such as pot-herbs with millet, bran bread, radishes, gourds, arrache, spurge, spinach, the noses, ears, throat, lungs, and intestines of animals, chicken wings, old cheese, and pomegranates.[20]

[15] BN 7446, fols. 24r-25r.

[16] *Ibid.*, fol. 25r, "Exercitium igitur est una ex nobilioribus et melioribus rebus que corpori humano possunt applicari in regimine sanitatis et prolongatione vite."

[17] *Ibid.*, fol. 25v, "opipara ac delicata."

[18] *Ibid.*, fol. 26r, "cruditas itaque postremi ferculi digestionem primi inchoatam moratur ac impedit."

[19] *Ibid.*, fol. 26v, "Sed nequeo (inquies fortasse) inter lances mensasque regalibus epulis opipare intentes atque splendentes appetitum frenare naturalem."

[20] BN 7446, fol. 27v.

Jehan de la Gutte is advised to bathe frequently before eating, "especially in the dry baths which they call *stuphae* or in the natural baths of sulphur and alum which they call *thermae*. There are some in the duchy of Bourbon which would lead you right on to health and long life, and I have tested their virtue and nature by experience."[21] A gentle massage would also do Jehan's obesity good, and in the experiments of the philosophers vinegar baths are strongly recommended for reducing.[22]

True and false thirst should be distinguished. True thirst exists when there is a burning sensation in the mouth of the stomach and should be relieved by drinking with sobriety. Jehan's wine should not be sharp or fiery or heavy or sweet but white, thin, clear, and limpid. False thirst is when the mouth, throat, or palate burns so that the voice almost clings to the jaws because of vehement movement or heat or drunkenness or excess of salt or hot foods. "Then it is not good for you to drink."[23]

Conrad believes in having the chief meal at night and gives the following reasons why it is a better time for digestion. First, the air is colder and aids the natural heat for digestion "by repelling it to the internal organs." That is why men eat more in northern regions or in winter. Another advantage is that the mind and body are more tranquil at night than during the day. The animal virtues are at rest, and the day's occupations and worries cease. Furthermore digestion is aided by sleep through the friendly silence of the night without interrupting noises. After the more moderate morning repast Jehan is advised to rest mind and body a while, "either sitting or, better, standing," by reading or listening to something rather light and amusing such as the fables of the poets, funny stories, histories of kings, heroes,

[21] *Ibid.*, fol. 27v: "3ª frequenter balnearis ante cibi sumptionem precipue in balneis siccis quas stuphas appellant aut in balneis naturalibus sulphureis vel aluminosis quas thermas appellant cuiusmodi sunt in Bourbonio que tibi summe conducerent ad sanitatem et vitam protelandam earumque vim ac naturam experimento probavi."

[22] BN 7446, fol. 28r: "Decima est fricatio mollis que tibi valde competit quia rarifactiva est et aperitiva. Dura autem et fortis poros claudit. In experimentis item philosophorum traditur quod balneum aceti continuatum tribus aut quatuor diebus singulis diebus per sex vel octo horas omnem tollit pinguedinem."

[23] *Ibid.*, fol. 28r.

and saints. Cheerful conversation is also restful. Or Jehan may walk about slowly to settle his food.[24]

Conrad expresses a view much like that of the physician of Valencia in the previous century,[25] although he probably did not know of his work, when he holds that if a person takes a nap in summer he should remove his shoes so as to permit the superfluous fumes and vapors to escape and not remain in the body to disturb and overheat it, impede digestion, obscure the vision, and dull the mind. But the feet should be covered to keep them from growing cold, since the extremities are naturally colder while one is sleeping.[26] Both the duke of Bourbon and Jehan de la Gutte are cautioned against sleeping immediately after eating, which is said to injure the vision.[27]

Heingarter also shared the common medieval view that it was bad to sleep lying flat on one's back. A reason he gives is lest superfluities flow back into the brain and impede memory. After awaking from sleep, however, one may lie on one's back for a time to straighten out the limbs and spinal joints.[28] Head and chest should be placed higher than the other members in sleeping, especially after eating heavily.[29] After sleep one should take care to evacuate the body. Coughing and blowing the nose the first thing in the morning are also recommended. Scratching or combing the head at that time, another common medieval piece of advice, is further recommended to the duke of Bourbon,[30] and Jehan de la Gutte is assured that it aids the sight.[31] Jehan de la Gutte is advised to wash his face and hands in warm water in winter and cold in summer, while the duke is told to use tepid water for this purpose at all times. Jehan de la Gutte is to brush his teeth with aromatic dentifrices such as lemon peel.[32]

[24] BN 7446, fol. 29r-v.

[25] See my "Advice from a Physician to his Sons," *Speculum*, VI (1931), 110-114; English translation in *Annals of Medical History*, New Series, III (1931), 17-20.

[26] BN 7446, fol. 29v.

[27] *Ibid.*, fol. 33r: BN 11232, fol. 29r.

[28] BN 7446, fol. 29v.

[29] *Ibid.*, fol. 30r.

[30] BN 11232, fol. 30r.

[31] BN 7446, fol. 33r, "Confortant autem visum usus feniculi frequens capitis pectinatio in mane stomacho ieiuno."

[32] BN 7446, fol. 30r: "Dentes quoque cum dentifriciis aromaticis confricando ut cum cortice citri."

Tyriac and some other compound remedies[33] are prescribed for Jehan de la Gutte, and he is told that sapphires and emeralds, as well as various herbs, conserve the vision.[34] Various compound medicines and pills are prescribed for the duke of Bourbon.[35] He is told that arthritis is rarely due to one humor alone, and that the changing constellations call for a variety of remedies which should be altered at least every two days.[36]

The duke is warned to make use of narcotics only with great caution.[37] When, however, the pain becomes unbearable, narcotics and sedatives may be cautiously employed.[38] Whereupon several pages are devoted to them, after which a few words are said concerning laxatives and clysters.[39] The duke, however, is assured that he need not take all the medicines which have been listed, "but now one, and now another, because nature delights in diversity, and the diversity of humors and of the stars requires this."[40]

The duke of Bourbon is warned to shun the air where large fetid animals live such as pigs, bears, camels, and especially lions, since such air is very injurious.[41] He also should beware of metallic fumes such as those from quicksilver, other metals, and the sublimations of alchemists.[42] In the morning he should open his window toward the east, at noon to the south, and in the evening to the west, so that the sun's rays may enter and purify and enliven the air.[43] He is warned against sexual inter-

[33] BN 7446, fol. 32v.
[34] *Ibid.*, fol. 33r.
[35] BN 11232, fols. 36-37r.
[36] *Ibid.*, fol. 38r, "Ideo est quod unum remedium modo iuvat et modo non."
[37] BN 11232, fol. 38v, "Tamen prius te moneo et iterum te moneo ne dictum yarcosophi a tua labatur mente sic dicentis, 'Caute apponamus narcotica epithimata aut inunctiones et reliqua.' "
[38] *Ibid.*, fol. 39v: "Cum autem dolores magni et intollerabiles fuerint in tantum quod virtutes prosternant, tunc uti oportet narcotis et frigidis et stipticis defensivis et dolorum sedativis cum cautela ut iam diximus."
[39] The listing of narcotics runs from fol. 39v to 43v, "Illa que usque huc diximus sunt narcotica," whereupon ensue other sedatives which are not narcotics. These continue to fol. 44v; laxatives follow to fol. 46v; and clysters from there to fol. 47r.
[40] BN 11232, fol. 47v. "Etsi aliqualiter prolixus in hoc capitulo fuerim (parcere velis princeps excellentissime) non intelligo quod omnibus illis que diximus utaris sed modo uno modo alio quia natura diversis gaudet et humorum et stellarum diversitas hoc requirunt. . . ."
[41] BN 11232, fol. 27v.
[42] BN 11232, fol. 33r.
[43] *Ibid.*, fol. 27v.

course as a result of the memory of past enjoyment and with thought and not by physical excitation, since it takes away all the strength of the body, and plunges men into extreme old age before their natural time.[44]

Conrad Heingarter was a plain spoken physician who did not hesitate to tell his patients, no matter how high they might rank in the official, social, and governing scale, exactly what he thought of their state of health and mode of life. Perhaps it was in part because he was on such intimate terms of long association and personal friendship with Jehan de la Gutte and John II, duke of Bourbon,[45] that he ventured to speak so frankly and even sharply to them—that, too, in written treatises which were preserved for the eyes of future generations, if not of contemporaries. But that he had the courage to speak out whether they liked it or not may be inferred from an astrological passage in his prediction for 1476 to Louis XI. His second conclusion for the summer quarter of that year is that the condition of the most Christian king of France and of his princes will be unfortunate (*damnosus*) so that they will lose many of their goods and poverty will fall upon their people and destruction and wraths will assail them.[46] It is true that this bad news is then somewhat softened by the assurance that it will not last long, and that the king will be victorious in wars and healthy in body. Nevertheless it seems to show courage, especially considering

[44] *Ibid.*, fol. 31r-v.
[45] He alludes to Jean de la Gutte in his *Advice* to the duke of Bourbon as "your servitor" and "a man worthy of praise," and also to a third John, "my particular friend, your secretary." BN 11232, fol. 21v, " . . . et tunc efficitur fleumaticus ut in Iohanne de la goutte tuo servitore apparet et quia ipse est homo laude dignus quare amicum meum singularem tuum secretarium Iohannem cum ipso in tali complexione locemus."

Heingarter is also described as a friend of Jehan de la Gutte in a poetical *Epigramma* by Erhardus Ventimontanus which follows the *Advice* of Conrad to Jehan. Erhard further urges Jehan to be Conrad's patron and Maecenas. BN 7446, fol. 34r, "Ad insignem virum Iohannem de la gutte illustrissimi principis Bourbonii ducis generalem Erhardi Ventimontani Epigramma. . . .

Fortunatus et O tu digne pater generalis!
Cui vir tantus adest iunctus amicitia."

. . . . . .

(fol. 34v) "Mecenas et ei sis, venerande pater."

[46] BN 7450, fol. 13v.

to whom it was addressed, and so it is with Conrad's medical counsel.

In this connection it may be noted that Jacques Coitier, who became Louis XI's physician from about 1470 until that monarch's death, was even more outspoken toward his royal patient. In fact Commines tells us that he was so rude to the king that he used outrageous words such as one would not address to a valet. Yet he was heaped with offices and donations, and seemed to hold a complete ascendancy over Louis' spirit.[47]

Jehan de la Gutte's *complexio* is described as follows, that is to say his *complexio radicalis* or fundamental, normal, and permanent physical constitution and characteristics, not his passing state of health at some given moment. His predominant humors are phlegm, cholera and blood, and he is told that unless cholera were mixed with the other two, he would long since have grown excessively fat. "By the dominance of phlegm you are lazy, drowsy, and a deep sleeper; by blood you were also prodigal, vagrant, given to love and lust especially in youth; while by cholera you are quite irascible."[48] In the *Advice* to the duke of Bourbon Jehan was classed with the duke's secretary John as of phlegmatic *complexio,* while the ducal chamberlain was pronounced of sanguine temperament.[49] Conrad, indeed, displayed neither delicacy nor mercy in alluding to the corpulency of Jehan de la Gutte. He tells him that while joy and gladness are good for most men, and anger, sadness, and fear are harmful, in his particular case many grave cares and worries would be beneficial as tending to work off his excess fat and reduce the corpulency of his body. Conrad does not

[47] See A. Chéreau, "Jacques Coitier, médecin de Louis XI," *Union médicale,* XI (1861), 449-457, 497-504, 545-554, 561-568; also published separately at Poligny, 1861, 34 pp. See also what Chéreau says in *Union médicale,* XV (1862), 337.

[48] BN 7446, fol. 16r-v, cap. 1: "Complexio itaque (fol. 16v) tua radicalis ex fleumate colera et sanguine constat. Nisi etiam colera fleumati et sanguini commixta in te fuisset, iamdudum nimie pinguedinis in te massa superabundasset. Cum itaque per fleumatis dominium piger somnolentus atque profundi sis somni per sanguinem quoque prodigus vagus venerius atque lascivus precipue in iuventa fueris, per coleram insuper admodum sis irascibilis."

[49] BN 11232, fol. 22r, "dicitur sanguineus ut in camerario tuo domino de clerieulx clarat."

seem to favor violent physical exercise for Jehan, but urges that as his bodily toil is lessened, so he should exercise his mind more. He should avoid nothing more than sloth and unworthy pleasures of the body.[50]

To the duke of Bourbon his physician gave not only medical advice but moral counsel and correction. Conrad chides the duke for his propensity for adulation and warns him that ills will befall him thereby. For if some old witch comes along or vagabonds (*cursores*) who are wholly uneducated and "promise you with their lies health, flattering you for money, you are most ready to obey them. . . ."[51] So beware of receiving so many wandering quacks lest they deceive you under pretense of benefiting you. And beware of the monks."[52] Again a little later among a list of ills which threaten the duke is mentioned "that you will be deceived or worried by ecclesiastics. Again I say—Take care, for there a snake lies hidden in the grass."[53] It is even suggested that the duke may be poisoned by ecclesiastics while travelling.[54] Part of the duke's infirmities are inherited, "but part you have acquired by your evil living in committing great excesses against nature and in believing persons to be doctors who are utterly ignorant of all letters, who have disturbed your humors and weakened your limbs."[55]

Professional jealousy and personal *amour-propre* perhaps ac-

[50] BN 7446, fol. 30r, cap. 5: "Quamquam itaque ira tristitia atque timor noceant hominibus eucryte ac bone habitudinis: gaudium vero et letitia eisdem competat et conducat. Tamen in te, pater optime, contrarium apparet, qui iam ad complexionem et habitudinem corporis discrytam et ad nimie pinguedinis materiam lapsus es. Multe itaque cure graves atque sollicitudines (fol. 30v) tibi proderunt, pater optime, ad corporis tui extenuendam crassitiem. Ut enim labores corporis tibi minuendi sunt, ita exercitationes animi augende. Nihil itaque magis cavendum est tibi quam ne languori desidie aut corporis voluptatibus viro indignis te dedas."

[51] BN 11232, fol. 9v, cap. 4: "certe illud experientia est in re probatum, nam si aliqua vetula veniret vel cursores et omnium litterarum ignorantissimi qui aut propter adulationem aut propter pecuniam tibi mendaciis suis promitterent sanitatem, ad obediendum eis illico es paratissimus."

[52] *Ibid.,* fol. 10v: "Cave ergo ne tot extraneous cursores capias ne te sub specie boni decipient; et cave a monachis."

[53] *Ibid.,* fol. 11r: "et quod a viris ecclesiasticis vel decipieris et anxiaberis. Iterum dico, Cave bene, nam ibidem latet anguis in herba."

[54] *Ibid.,* fol. 10v.

[55] *Idem.*

count in some measure for Conrad's denunciation of the wandering charlatans, gipsies, and healers to whom the duke gave too ready ear, but the picture he paints is the more impressive since it parallels that which John of Arezzo drew of the situation in fifteenth century Florence, where nobles as well as populace were too prone to resort to quacks and uneducated practitioners instead of to learned physicians with a medical degree.[56] And we have seen that quacks were allowed to try to cure the madness of Charles VI of France. The reason for Conrad's warning the duke against monks and ecclesiastics is less apparent, but he probably did not merely read this danger in the stars.

We find Conrad again scolding his ducal master for his violation of the laws of health and canons of medicine towards the close of the treatise.

> My lord, if you would pay a little attention, your errors will be made manifest from the present chapter and the cause of your evil walk. But the stars influence you so that you do not care but ever follow your own views which are injurious to you. For you always dissolve and dissolve and know nothing else, or you do one of these two things, either to deaden the pain (*stupefacere*) or to dissolve. One thing I ask you, What is it that produces such hard shells in animals having shells on their backs? And yet that material is at first quite liquid and phlegmatic. What is it that turns white of egg placed in the sun to stone, although it is phlegmatic and liquid? Surely nothing else effects this than the heat of the sun dissolving the subtle parts and hardening the gross. Don't you think, then, that the same thing may happen from those dissolutions in your joints? It certainly will unless you are careful to reform. Turn then from your error and follow the path which wise philosophers point out to you—they who have said nothing without a reason—and prefer medicines that soften to those that dissolve.[57]

Perhaps part of Conrad's purpose was to give the duke a good fright and so lead him to mend his ways. At any rate, adducing such astrological authorities as Ptolemy, Abraham, and Haly, he tells him that the stars threaten him with the following formidable array of ills and ailments.

[56] See my *Science and Thought in the Fifteenth Century* (1929), p. 49.

[57] BN 11232, fol. 49v.

> Augment of cholera and its fermentation, with a portion of phlegm. . . . You will spit blood, as appeared in your attack of pleurisy, and this likewise happened when you were at Meaux. . . . You will grieve because of an incision which you will cause yourself, and from this great ill will befall you . . . liver complaint . . . descent of phlegmatic humidities especially on the left side . . . thinness, internal injuries, and a cough with a disposition to colic and vomiting . . . gout and lame hands . . . an impediment in the left eye from weakness or some venomous animal.[58]

In another passage the following parts of the duke's anatomy are mentioned as menaced—some of them twice: chest, stomach, ribs, spleen, lungs, heart, neck, intestines, veins, private parts, taste, throat, the whole left side, hands and feet, liver, left eye, right ear, gall bladder, and nostrils.[59] In a third obscure passage the duke is threatened on the authority of Haly with further ills such as being burned, perhaps from application of the cautery, and being bitten by dogs.[60]

In the prefaces of the two works written for him the duke of Bourbon is naturally addressed by Conrad in a more complimentary tone, as was usual in such circumstances. In the commentary on the *Quadripartitum* of Ptolemy he is praised as a patron of the arts and of students and another Maecenas. When he saw how many volumes had been lost through the fall of Constantinople to the Turks,[61] he gave his attention to building up a library, collecting worthy books from all parts of the world and having them repaired and emended.[62] Yet he was famous in times past as a warrior against the English in France. He looks to the future, too, and cultivates astronomy and all its professors.[63]

[58] BN 11232, fols. 9r-10v.

[59] *Ibid.*, fol. 12r-v.

[60] *Ibid.*, fol. 10r, "Et ultra dicit quod tu infirmaberis extra locum tuum et ignis combustionem facies per quam malum plurimum tibit accidet. Insuper dolores narium et morsure canum tibi eveniunt."

[61] Other evidence, however, gives us the impression that the Turks sold more Greek manuscripts than they destroyed.

[62] BN 7305, fol. 4r: ". . . ut enim Constantinopolitane cladi consideras qua nuper crudelis Turci sevitia tot optimarum litterarum volumina naufragio submersit, ex omnibus mundi partibus dignos quosque libros afferri iubes qui ut bene reparentur emendatioresque sint summopere curas."

[63] *Ibid.*, fol. 4v.

CHAPTER LVI

HUMANISM IN RELATION TO NATURAL AND OCCULT SCIENCE

Burckhardt in his well known work on the culture of the Italian Renaissance has admitted the proneness of the humanists to astrology and the superstition to be found even in men so supposedly enlightened as Poggio and Politian.[1] Of the attitude of humanists towards science and occult science we have already taken some notice in the case of Petrarch and others, and we shall continue in chapters yet to come to treat of individuals some of whom might be ranked as humanists. The present chapter is therefore neither an exhaustive nor all inclusive treatment, but merely further illustration, drawn chiefly from the writings of a few individuals in the second half of the fifteenth century.

Sicco Polentone died in 1463, but his teaching of philosophy and astrology at the university of Padua fell in the first half of the century; in later life he devoted himself primarily to the history of literature and the profession of a notary and became chancellor of Padua.[2] Zabughin has noted lines in the poems of Filippo Callimachus, one of the humanists concerned in the conspiracy at Rome against Paul II, which denote astrological fatalism. On the other hand, the opposition to magic of Pomponius Laetus which he remarks was merely the normal attitude.[3]

[1] See also F. Boehm, "Volkskündliches aus der Humanistenliteratur des 15. und 16. Jahrhunderts," *Zeitschrift des Vereins für Volkskunde,* 1915, p. 19.

[2] Giuseppe Vedova, *Biografia degli scrittori padovani,* 1832-1836, II, 119-120. Io. Erh. Kappius, *Dissertatio de Xiccone Polentono,* Lipsiae, 1733, 66 pp., states (p. 15) that Xicco studied philosophy with Cajetan de Thienis and rather apologizes for his attention to astrology, "Neque Polentonus noster ex more illius seculi astrologiam plane insalutatam reliquit." At pp. 19-28 Kappius published Sicco's two letters on the (supposed) finding of the bones of Livy at Padua.

[3] V. Zabughin, *Giulio Pomponio Leto: saggio critico,* I (1909), 186-187; II (1910), 233-236.

That we should not hastily conclude from a single passage in his works that this or that humanist was a foe of all superstition and occult science is well brought out in the case of Poggio Bracciolini by Gabotto. Poggio reproached Tommaso da Rieti with having deceived a youth into thinking him a diviner by purloining a private letter and acquainting himself with its contents. He pretended to foresee the future in a bronze mirror made by magic art and to perform other marvels. Poggio did not accuse him of invoking demons but said that he did not know how and deceived his victim with words.[4] On the other hand, Poggio believed in the power of the stars and would not accept the opposition of the theologians to astrological predictions or the argument that God might change the stars' decrees.[5]

Similarly Nicholas of Cusa in a sermon of January 6, 1439, on the magi and the star might declare that the astrologers are fools with their vain imaginings.[6] But in his *De docta ignorantia*[7] he showed belief in the influence of the stars; at the diet of Nürnberg he urged on behalf of the pope that the council of Basel was under an evil constellation; and in one of the manuscripts of his library are notes in his own hand correlating various historical events with astronomical observations. He also engaged in calculations, based on the *Book of Daniel,* as to the time of the end of the world. He holds that the year of the Lord is the jubilee of fifty years, or seven times seven plus one, that there were thirty-four such jubilees between Adam and the deluge, and that this was the first of the four times of which God told Moses according to Philo. The second such period of

[4] Gabotto (1889), pp. 383-384, citing a Laurentian MS for which he gives an insufficient shelf-mark but which I presume is FL Plut. 90 supra, cod. 7, fol. 1 *et seq.,* Poggii Florentini in Thomam Reatinum spurcissimum ganeonem Invectiva.

[5] Gabotto (1889), p. 384, citing *Epistolae,* IX, 16, ed. Tonelli, 1859.

[6] "Fatui sunt astrologi cum suis imaginationibus": quoted by Edmond Vansteenberghe *Le cardinal Nicolas de Cues,* Paris, 1920, p. 247.

[7] II, 1 and 12 (*Opera,* Basel, 1565, pp. 22 and 41). Cited by Vansteenberghe, *idem.*

1700 years was from the flood to Moses; the third, from Moses to Christ. We are now—in 1452—in the fourth period; twenty-nine jubilees have elapsed and soon—in 1700 or 1734—1700 years from the birth or death of Christ, antichrist and the last judgment will be at hand.[8]

Nicholas of Cusa possessed a fertile brain and versatile intellectual curiosity which delighted in darting off on explorations of many fields including mathematics and natural science. He adopted the Parisian theories of impetus and inertia of the previous century. Like various predecessors and contemporaries he urged reform of the calendar and revision of the Alfonsine Tables, now become somewhat antiquated and in error. He bequeathed to the hospital of his native Cues on the Moselle a set of astronomical instruments said to be the oldest in existence in Germany, although they are not otherwise remarkable being those in common use in his day. One of the earliest maps of central Europe has often been assigned to him.[9] His most notable writing from the scientific standpoint is his dialogue concerning static experiments,[10] completed at Fabriano on December 13, 1450. On the strength of it Sir William Osler characterized Nicholas as "one of the pioneers in modern mathematical physics" whose "studies on measurements and specific gravity are of the first importance."[11] It is the last of four books of dialogue between an "orator" who seems to represent the current humanist type of learning and an "Idiota" or man in the

[8] *Coniectura domini Nicolai de Cusa de novissimis diebus.*

[9] Vansteenberghe, p. 250. If I do not devote an entire chapter in the present volume to Nicholas, it is not that I regard him as of less importance than others whom I have made subjects of chapters but because I have already devoted a chapter in my *Science and Thought in the Fifteenth Century* to one phase of his science, and because Vansteenberghe has made so careful a study of him. As to the date and authenticity of "the so-called Nicholas of Cusa" map see Dana B. Durand, "The Earliest Modern Maps of Germany and Central Europe," *Isis,* XIX (1933), 486-502.

[10] An English translation of it was printed at London in 1650 and more recently by Henry Viets in *Annals of Medical History,* IV (1922), 115-135. I have used the Latin text in the Basel, 1565, edition of Cusa's *Opera, Idiotae libri quatuor,* I, 137-180, of which the *Idiotae de staticis experimentis dialogus iiii,* occupies pp. 172-180.

[11] *Bibliotheca Osleriana,* Oxford, 1929, No. 7465, note.

street who decries mere book learning and is usually identified with Nicholas himself. The first three books are philosophical, dealing with wisdom, God, the infinite, and the mind. In the third book a philosopher joins the discussion. But the fourth book alone concerns us here. It urges the importance of measurement, especially weighing by means of the balance and timing by means of water clocks or sand glasses. Mechanical clocks are not mentioned, whether because regarded as not sufficiently accurate or because not lending themselves so well to the process of weighing—the lapse of time being measured by weighing the amount of water or sand which has fallen during it. Nicholas of Cusa may to some extent be considered an early forerunner of Black in his advocacy of constant use of the balance. Before Galileo he suggests timing the fall of bodies dropped from towers of equal height and takes the resistance offered by the air into account. And Osler noted that "he records the famous experiment, antedating Hales[12] two hundred years, of weighing earth and seeds, then the resulting plants, their ashes and the earth in which they had grown." It must be added, however, that Nicholas had no idea of plants or earth receiving sustenance from the air but thought that the ashes of the plants would show the weight of the element earth in them, after the water had been burned out. Furthermore he did not record the experiment, he merely advised it. There is no evidence that he or others then performed it. Moreover, Cusa cannot be said to give precise and detailed instructions for any of his static experiments. The dialogue consists merely of brief suggestion of various directions which such experimentation might take.

The *Static Experiments* influenced Leonardo da Vinci, but it should also be said that they appear indebted to earlier authors, like Archimedes whose Eureka experiment is paraphrased without acknowledgment, or Adelard of Bath whose comparison of followers of authority to a horse led by a halter is repeated without mentioning him. Medieval works on weights and the balance like that of Jordanus Nemorarius, or more recently that of

[12] Stephen Hales, *Vegetable Staticks,* 1727.

Blasius of Parma, also anticipate much that Nicholas says. The effort to penetrate to the essential character of the elements and first qualities by weighing them is somewhat analogous to the efforts of Perscrutator and Walter of Odington to juggle with their degrees. Some of the devices for measuring time, the depth of water, and the like are paralleled much more fully in the writings on these themes of a contemporary such as Giovanni da Fontana. But in spirit, if not in substance, the resemblance is closest between the experimental science of Nicholas of Cusa and that of Roger Bacon.

Nicholas, like Roger, still thinks of experiments in the medieval rather than modern sense, and his praise of experimental method is, like Bacon's, not entirely self-consistent. The *Idiota* may decry mere book learning and be found making wooden spoons. Yet he grants that experimental science demands an extensive literature. "For the more records of experiments there are, the more easily we can come from experiments to the art which is elicited from them." Thus as with Bacon experimental method is a handmaid of useful arts and applied science. And if Nicholas does not mention magic by name in connection with experimental science, he does introduce into his discussion of it such matters as astrology and alchemy, weather prediction, occult virtues, the sphere of life and death of Pythagoras, and lot casting from the Psalter or sibylline books, geomancy, and augury. He presently adds with reference to the last four named methods of divination that he does not think an art possible in them or that a wise man ought to occupy himself with them. But he has confused and correlated occult science with experimental science indistinguishably, and it is evident that his zeal for experimentation and measurement has not lessened any the credulous interest which he shared with his age in subjects and procedures now deemed by scientists superstitious.

This may be illustrated by running over in some detail the contents of the *Static Experiments*. In the first place, it should be realized distinctly that the discussion is by no means limited to, nor even primarily concerned with what we should call statics.

Such problems of pure physics play a rather minor rôle. Prominent is the notion that the properties, the qualities, and the occult virtues of things in nature can be gotten at by a comparative study of their weights, although just how this is to be effected and the transition made from quantitative to qualitative is none too clearly expressed. Different kinds of waters are to be distinguished by weighing them and their peculiar properties discerned and also those of water in general. Nicholas would weigh the stems, leaves, roots, and juices of herbs from various localities as a better means of comprehending their medicinal properties than by taste alone. He would test the patient's urine by its weight as well as its color. To learn the difference between dry and moist he would weigh green and dry wood; to tell hot from cold he would weigh warm water and ice.

Such discussion soon leads into the domain of alchemy. In connection with the different weights of objects in different *media*—air, water, oil, or other liquids, considerable attention is given to weighing things in water or by the amount of the liquid they displace. It is stated without mentioning Archimedes that one could thus tell how much copper was mixed with gold or silver in coins and detect false works of alchemy from true. It is added, however, that while lead is about the same weight as gold, it is farthest from it in perfection. In the fire of fusion less lead adheres to gold than any other metal. It is also said that the alchemists try to control quicksilver in the fire, until it not only does not flee from gold but holds all the metals fixed with itself and approaches the weight of gold, remaining fluxible and malleable, and dyes with a fixed and permanent color. When the orator asks whether the *Idiota* thinks that the alchemists can attain their goal, he answers somewhat evasively that they cannot do so to the fullest extent (*Praecisio manet inattingibilis*) but that the test of the balance and fire will show how far they succeed. The genuineness of different precious stones may likewise be tested by the balances. Asked if the virtues of gems can also be determined by weighing them, he answers that the

amount of iron which a magnet will attract can be so measured and also the weight of the diamond needed to counteract the magnet's power. It is also held that the artificer can determine how much sulphur and quicksilver each of the metals contains by this method. In Hungary there is a water which has such virtue of vitriol in it that it turns iron into copper. By weighing different earths and waters one might get some notion of the nature of the pure elements, and by weighing various composite objects learn more of their occult virtues.

Weather prediction is introduced by measuring the purity or humidity of the atmosphere by weighing wool exposed to the air in one pan of a balance. Or Nicholas would forecast the fertility of the coming year by comparing in each month of March the weights of air, water, and wood with those at that time in previous years. It is even discussed how to answer the interrogations which are made to astrologers, but the only weighing involved appears to be mental. The insufficiency of Nicholas of Cusa's mechanical knowledge is shown in his timing the speed of a ship by noting the time elapsed between discharging a cross-bolt from the vessel's prow and overtaking the fallen arrow. The somewhat crude and quaint character of his thought and method is illustrated, in connection with his scheme for timing one hundred pulse beats or breaths of various persons and ages, by the inference that, if a healthy boy were found to have the pulse of a decrepit old man, it would be a sign of his early death.

Thus the *Static Experiments* of Nicholas of Cusa, like the experimental science of Roger Bacon, look backward as well as forward and are representative of, rather than markedly in advance of their time. If the ideal of measurement comes in more than in Roger Bacon's works, this is partly at least because of the steps taken by intervening men in that direction. With this ideal of scientific measurement something of the old conception of magical virtue is still intermingled. Alchemy and astrology and the occult virtues of gems, herbs, and fountains

still play a larger part in contemporary science than do pure physics.

The humanist Aeneas Sylvius who later became pope Pius II felt that some knowledge of astrology was essential for a ruler. In his educational treatise he affirms that "a prince must not be ignorant of astronomy, which unfolds the skies and by that means interprets the secrets of Heaven to mortal men."[13] Aeneas's faith in astrology is further attested by such a passage in his letters as that to Piero da Noceto from Basel on May 21, 1437, in which he describes the stormy session of May seventh when contradictory resolutions were proposed as to the place, Avignon or Florence, where representatives of the Greek and Roman churches should meet. He gloomily ascribes the fact that things are not going well at the council to the discordant influence of the planet Mars. But this redounds to the advantage of Florence, which city is said to have been founded under that planet. Aeneas is further impressed by the fact that the events to which he alludes occurred on Mars' day or Tuesday, that all the stars agreed in causing dissension, and that certain of the astrologers affirm that it was under Mars that the Great Schism began which was healed at Constance, and also that Mohammedanism originated, with Jupiter in the tail of the Scorpion. He hopes that these are fables and dreams rather than the presages of a true seer, but he cannot shut his eyes to the fact that two conflicting decrees have been published in a single session, and that attempts have been made to depose the papal presidents at the council.[14]

Aeneas was somewhat sceptical. When in Scotland he wished to investigate the story of the barnacle geese who, he had heard, grew on a tree by the banks of a stream. Those that fell on dry ground rotted away but those that fell in the water took on

[13] *De liberorum educatione*, translation of W. H. Woodward, *Vittorino da Feltre and Other Humanist Educators*, 1912, p. 156.

[14] Rudolf Wolkan, *Der Briefwechsel des Eneas Silvius Piccolomini*, in *Fontes rerum austriacarum*, LXI, 74-75. The text in Mansi, XXXI (1798), cols. 220-229, seems more accurate than Wolkan's but errs in dating the letter of Aeneas on May 20.

life beneath its surface and flew off in the air. But he found that "miracles always disappear into the distance,"[15] for he was told that this tree was not in Scotland but in the Orcades. On the other hand, he repeated such statements as that the dogs of Rhodes would fawn on Christians but bite Turks and that the Franks were of Trojan origin.[16] In his *Commentaries*[17] he refers to the poisoning of Charles the Bald and Henry VII in Italy and narrates the dreams of Frederick III, when Nicholas V was as yet only a simple bishop and not even cardinal, that Nicholas would crown him emperor, and of Nicholas on the night of the death of Eugenius IV, that the pope told him to take his place. He also describes an image of the Virgin which the people venerated as controlling the weather, and tells of a field of herbs which was divinely revealed to Charlemagne to save his army from the pest. This last, however, he thought a fable and the invention of lovers of Charles. He represents Mohammed as using incantations and magical illusions, and tells how the leader of a gang of ruffians and conspirators at Rome confessed when captured that he had been led on by diviners who predicted the fall of the papal power that year. When Aeneas himself had fever for seventy-five successive days he nevertheless refused the ministrations of an enchanter, although one was brought to his bedside who said that he had recently freed two thousand men from fever at the camps of Niccolò Piccinino, condottiere and despot of Bologna in 1438 who died in 1444.

Filelfo appears to have been one of the most sceptical of the humanists with respect to the occult arts. We shall later have occasion to note some of his jibes against astrological predictions. In a letter printed by Fabroni[18] he assailed alchemy, putting it in the same class with necromancy and geomancy, or characters, incantations, and love philters. He declares,

[15] *De Europa,* cap. 46: *Opera,* Basel (1571), p. 443. "De qua re cum audivimus investigaremus didicimus miracula semper remotius fugere."

[16] *Historia de Asia minori,* cap. 88; *De Europa,* cap. 38; *Opera,* Basel (1571), pp. 370, 433.

[17] For the passages that follow see *Commentarii,* Frankfurt, 1614, pp. 58, 20, 37, 217-218, 33, 119, and 7 respectively.

[18] Angelo Fabroni, *Laurentii Medicis Magnifici Vita,* 1784, II, 22 *et seq.*

Those who think that, by spoiling and corrupting copper, silver or gold can be made, seem to me stupid fools. But triflers of that type devise certain names of herbs and other such things, known to themselves alone and which produce nothing but wild fancies and frauds.

Filelfo asserts that they falsely ascribe their writings to Solomon, St. John, and Ambrose. He even declares spurious the *Secret of Secrets* ascribed to Aristotle, and the chief authority for his favoring transmutation. Filelfo is himself guilty of a false etymology in calling the alchemists *chalchimistae* and affirming that they derive their name from the Greek *chalkos* or word for copper. Despite his jibes at astrologers elsewhere, he now affirms that the three magi who followed the star of Bethlehem were, unlike the alchemists, true philosophers.

George of Trebizond, the Greek scholar who came to Italy fairly early in the fifteenth century, eventually out-lived his welcome and reputation, partly because his tendency to become embroiled in controversies exceeded his abilities. After he had lost favor with Nicholas V by a faulty translation of the *Almagest* of Ptolemy and commentary on the same, which he boasted of having completed in nine months,[19] he was driven from pillar to post and ended his career in misery. A brief work by him which bears the title, *Liber de antisciis et cur astrologorum iudicia plerumque fallant,*[20] and gives the current year as 1456 A.D.,[21] might at first sight seem unfavorable to astrology, al-

[19] BL Laud. Latin 111, paper, 15th century, folio maiori, fol. 152v: see also Tiraboschi, VI, i (Milan, 1824), 531-532, using an Ambros. MS.

[20] Vatic. Reg. Suev. 1098, 15 fols., rubric, "Georgii Trapezuntii Brevis de antisciis tractatus et cur his temporibus astrologorum iudicia fallant." Incipit, "Nunc quoniam rationem antisciorum quam maxime licet dissimulanter sequi Ptolomeus videtur. . . ." The first part deals with *antiscia;* the second part, beginning on fol. 6v, considers why judgments today go wrong, "Nunc aperiturus rationem quare temporibus nostris astrologorum industria falsa. . . ." The work ends, fol. 15v, ". . . ita ut nec potentioris dignitas negligatur nec commoda miscendi ratio quasi vana pretereatur." Other MSS are Vienna 5503, 1506 A.D., fols. 102r-109v, and Ossolinski à Leopol 795, fols. 114v-115r, a copy of 1505 A.D. by a professor of Cracow. The work was printed in 1524 with the edition of Omar, *De nativitatibus et interrogationibus* by Lucas Gauricus, but this rare edition I have not seen. The second part only was printed in Marstallerus, *Artis divinatricis . . . encomia,* Paris, 1547, pp. 148-165.

[21] Vatic. Reg. Suev. 1098, fol. 13r. At

though the use of the technical astrological term, *antiscia,* suggests a close familiarity with the art. By this Greek word are indicated opposite degrees of the zodiac, such as the third degree of Aries and twenty-seventh of Virgo, where the days and nights are of corresponding length in the two hemispheres. George argues that astrological prediction would often profit by taking this corresponding degree into account, a contention which he proceeds to illustrate from his own horoscope and life.[22] It is not, however, so much because they neglect this somewhat fine point of the *antiscia* that modern astrologers make frequent false judgments as because, in George's opinion, they follow incorrect theory and measurements as to the positions and movements of the stars. Just as in his commentary on the *Almagest* George preferred Ptolemy and the instruments of the Ptolemaic period to the medieval advance and tables, so here he again censures Leo Judaeus[23] and modern astrolabes. He rejects the hypothesis of a ninth sphere and holds that not the eighth sphere has a motion eastward but the stars in it. But astronomical tables reckon the beginning of Aries from the vernal equinox and do not take into account the changed positions of the fixed stars. George of Trebizond's tendency to reject medieval astronomical and astrological activity and put both the science and the art back where they were in Ptolemy's time cannot command much respect, especially as his own translation of the *Almagest* was found faulty by Nicholas V. But it was an attitude all too common among the humanists who in their enthusiasm for classical antiquity wished to go back to the bare text of Aristotle and Galen in much the same way. George of Trebizond's interest in astrology is further attested by his commentary on the pseudo-Ptolemaic *Centiloquium.* It was printed more than once.

Pier Candido Decembrio is said to have written no less than one hundred and twenty-seven different treatises. Among all these are one or two which evince more interest in natural sci-

fol. 3r he gives his age as sixty.

[22] For this autobiographical passage see Appendix 57.

[23] Vatic. Reg. Suev. 1098, fol. 7r, "Unde miror cur Leo Iudeus hanc opinionem secutus multa evomere in Ptolomeum et veritatem tam apertam non erubuit."

ence than was usual in the case of his fellow Italian humanists. We shall consider here his work on animals in five books and his briefer *De genitura hominis.* Decembrio was born at Pavia in 1399, became secretary to the duke of Milan in 1447, apostolic secretary at Rome in 1453, spent some time at Naples, and died at Milan in 1477.

Decembrio's five books on the natures of animate beings were begun, as he tells us, at Naples and were addressed to the marquis of Gonzaga, Ludovico, in 1460, but were never printed. The work was suggested by some anonymous commentaries on the subject which he came across in Naples and to which he added statements of his father, Uberto. He also cites or uses the works of Albertus Magnus, Thomas of Cantimpré, and Vincent of Beauvais a great deal. In all he covered about 460 animals, treating in his first book of terrestrial animals and quadrupeds, in the second book of birds and flying creatures, in the third of aquatic animals and fish, in the fourth of serpents and worms, while the fifth book was in the nature of a supplement and digression dealing with "Things worthy of memory and note." As Killermann has observed, the period between Albertus Magnus and Gesner is poor in works of natural history, and that of Decembrio does something to help fill the gap.[24] But it would seem to have been in the main a derivative and amateurish performance. Killermann was chiefly interested to identify the names of its animals and to fit them into our modern zoological classification.[25] He gives little idea of the worth of the work

[24] Killermann was probably not acquainted with a work on animals by a Gerard de Brolio, who seems to have been a canon of Clermont, which occupies an entire manuscript of the fourteenth century at the Bibliothèque Nationale, Paris, and was probably composed during that century. From its prologue it appears to follow Aristotle largely. BN 16166, 14th century, double columns, fols. 1r-192v. The prologue opens, "Sicut dicit philosophus in VI° methaphysice si nulla esset substantia. . . ." The author argues that science concerning natural substance is superior (*prior et nobilior*) to science concerning any accident. He then outlines the main divisions of natural science. For instance, the sixth part deals with animate bodies, and the eighth part with bodies animated by the sensitive soul.

[25] *Das Tierbuch des Petrus Candidus,* geschrieben 1460, gemalt im 16 Jahrhundert. (Codex Vaticanus Urb. lat. 276.) Zum erstenmal behandelt von Dr. Seb. Killermann. Mit 16 Abbildungen auf 8 Tafeln. In *Zoologische An-*

or its hospitality towards an unscientific and credulous view of animals. For these one would need to turn once more to the manuscript text.

De genitura hominis[26] is a brief treatise of less than ten pages in thirty-two very short chapters, setting forth the process of human generation and the influence of the planets upon the child before and after birth. Besides this astrology the work includes other bits of divination and magic. The womb and intestines of a hare dried and reduced to powder are given to a woman to induce conception, or one testicle of a hare pulverized is taken in wine to insure birth of a male. The liver and testicles of a suckling pig are recommended for the man. Another aid to conception is for the sterile woman to dip dirty wool in asses' milk and bind it over the navel. Decembrio, however, refuses to vouch for these prescriptions personally, taking them from other books. They are classed as proved by experiment, but often things happen to reduce faith in experiments of this sort.[27] He has more faith in the virtue of the stone ethites to prevent abortion and miscarriage, and asserts that many in Milan have been relieved when they received this stone at his hands. His uncle Marcatius, a skilled physician, procured one when Pier Candido was a boy, by climbing to an eagle's nest in the German Alps.[28]

Some say that if the woman moves her right foot first, it is a sure sign that the child will be a boy. Another test is to place a drop of blood or milk from her right side in a pure and liquid spring. If it sinks, the child will be a boy; if it floats, a girl. Fascination is accepted as a physical fact, the eyes of certain women poisoning the air and killing children.[29] The assertion of Avicenna is repeated that the hairs of women, if buried

nalen, Zeitschrift für Geschichte der Zoologie, Band VI (1914), pp. 113-221, and 8 Tables.

[26] I have used a rotograph of the edition of Geneva, 1498, in *Archana medicinae,* GW 2315, made from the copy in the Surgeon General's library, Washington, D.C.

[27] *Ibid.,* fol. a.ii.r-v.

[28] *Ibid.,* fol. a.ii.v-a.iii.r.

[29] *Ibid.,* fol. a.v.r-v.

in fertile ground, generate serpents. But it is argued against him[30] that a universal deluge would be impossible, since if the constellations favored it in one place, they would oppose it in some other region.

Astrologers were as welcome as humanists at the Hungarian court of that warrior patron of learning, Matthias Corvinus. Galeotto Marzio da Narni[31] was a little of both. At the age of twenty-three he began to teach the humanities at Padua, himself pursuing the study of medicine the while, and later he was professor of poetry and rhetoric at Bologna. He passed to Hungary to become the secretary of Corvinus, tutor of his son John, and head of the royal library, and spent a number of years there. He wrote in 1485 of the sayings and deeds of king Matthias,[32] and had earlier addressed to him his *De incognitis* or *De incognitis vulgo.*[33] This latter writing, as he informs us in the *De dictis et factis,* had led to his being accused of heresy in Venice in 1477 and imprisoned until pope Sixtus IV found him innocent, but his relations with the Hussites in Bohemia probably had more to do with the charges brought against him than did the large amount of astrology contained in the aforesaid book.[34] His *De homine,*[35] written about 1470, and dedicated to the archbishop of Gran, also contained much astrological matter. George Merula published an elaborate criticism of it about 1474,

[30] In the preliminary table of contents Aristotle is mentioned in this connection rather than Avicenna, "Quod non sit dare diluvium universale secundum Aristotelem."

[31] There seems to be no general agreement as to the correct form and order of his name. Chevalier, under "Marzio (Galeotto)" refers us to "Galeotti (Marzio)." Fraknoi, *Mathias Corvinus,* 1891, p. 295, calls him "Martius Galeotti aus Narni." A Chéreau, "Les médecins de Louis XI," *Union médicale,* XV (1862), 341, speaks of "Golothus Martius" but perhaps has a different person in mind. In BN 6563 we read, "Valeoti Martii Narniensis de incognitis wulgo . . ." In the printed editions of his works he is Galeottus Martius. I follow Tiraboschi in calling him Galeotto Marzio da Narni.

[32] *De dictis et factis Mathiae regis,* printed in *Hungar. rerum Scriptores,* Francofurti, 1600, and by Schwandtner, Vienna, 1746. There were earlier editions in 1563, 1611, and 1723. Fraknoi, *Mathias Corvinus,* 1891, p. 295, gives a fuller form of the title, "De egregie sapienter jocose dictis et factis S. Regis Mathiae."

[33] It seems not to have been printed. MSS are BN 6563 and Turin ML. I. I. 89.

[34] Gabotto (1889), pp. 394-395.

[35] It was printed at Venice (1471?), and a number of times thereafter.

to which Galeotto responded with a *Refutatio* in 1476. To Lorenzo de' Medici he dedicated his *De doctrina promiscua,*[36] a work as its title suggests, of miscellaneous content, dealing with various medical, physical, and astrological questions. Tiraboschi regarded him as a man of great erudition but writing in an unpolished style and infatuated with judicial astrology.[37] A manuscript at Padua which Tiraboschi did not note shows us that he was also given to chiromancy.[38] We are also told in *Naudaeana*[39] that there is a manuscript of his unprinted work, *De censura operum philosophicorum* in the royal library in Paris, and that in it he argued in favor of the existence of the antipodes. But what is referred to is very likely the *De incognitis vulgo,* of which there is still a manuscript in the Bibliothèque Nationale, formerly of the Bibliothèque du Roi, in the fourteenth chapter of which Lactantius' denial that the earth is round and that antipodes exist is "ridiculed and confuted."[40] Accounts of the manner of Marzio's death differ. Paolo Jovio has him die in old age in Italy near Este, suffocated by his own fat.[41] Another version states that he died at Lyons by a fall from his horse which the signs of his hands had not predicted to him.[42] But surely to have been forewarned of a fall from his horse it would have been more apropos to have noted the animal's physiognomy. Yet another version states that in trying to kneel before Louis XI, who had promised

[36] *De doctrina promiscua liber, varia multiplicique eruditione refertus, ac nunc primum in lucem editus,* Florent. apud L. Torrentinum, 1548. Another edition, Lyons, 1552.

[37] Tiraboschi, VI, i (Milan, 1824), 564-577, is given over to an account of Galeotto Marzio. I have not seen Abel, *Galeotto Marzio életrajza, Adalékok á Humanismus történétéhez magyarországon,* Budapest, Akademia, 1880. A. De Hevesy, *La bibliothèque du roi Matthias Corvin,* Paris, 1923, p. 15, shows that Galeotto was in Hungary from 1465 to 1468 as well as later; Dallari, *Rotuli,* I, 64, 67, 93, 96, 99, 102, that he taught at Bologna 1463-1465 and 1473-1477.

[38] Padua Antoniana XXII, 560, 16th century, Galeoti Martii Chiromantia, "Divinandi artes plurimas fuisse quis nescit . . . / . . . saturni ut dicunt aliqui."

[39] Gabriel Naudé, *Naudaeana et Patiniana,* 1701, pp. 56-57.

[40] BN 6563, fol. 34v. ". . . irridentur et confutantur rationes Lactantii negantis terram esse rotundam nec posse antipodes reperiri."

[41] *Elogia virorum literis illustrium,* Basel, 1577, p. 90.

[42] A. M. Iosa, *I codici manoscritti della Biblioteca Antoniana di Padova,* 1886, citing the notice of him published in 1859 by Marchese Giovanni Eoli di Narni.

him a large pension, he fell and, being excessively corpulent, "mourut sur le champ étouffé de sa graesse."[43] With this catastrophe the lines of his person might indeed have had some connection. Chronologically, however, the incident as it stands is impossible, since Galeotto wrote works after Louis XI's death and did not die himself until perhaps 1494. Either the French king in question was Charles VIII rather than Louis XI, or Galeotto Marzio has here been confused with another personage, perhaps a Golothus Martius who broke his neck in 1476 as he descended from his horse to salute the king at Lyons.[44]

We shall now look somewhat further into the contents of two of Marzio's works, the *De incognitis vulgo*[45] and the *De doctrina promiscua.* The former has thirty-one chapters, the latter thirty-nine. Even in the former work a handsome tribute is paid to Lorenzo de' Medici,[46] although naturally king Matthias Corvinus receives still more flattery,[47] since the treatise is addressed to him. But in the *De doctrina promiscua* the author repeatedly goes out of his way to include one or more puffs of Lorenzo the Magnificent.[48] It was written considerably later than the *De incognitis vulgo,* which refers to Giuliano de' Medici as sharing the rule with Lorenzo, whereas the Prohemium of the *De doctrina promiscua* mentions Innocent VIII.

The older work is especially concerned with "the differences" or points of disagreement between theologians and philosophers, a field where the unwary would be very apt to slip into heresy. To some extent the work is probably an imitation of the *Conciliator of Differences between Physicians and Philosophers* of

[43] Naudé, *op. cit.,* pp. 56-57.

[44] According to Chéreau, *op. cit.,* p. 341. See note 31.

[45] BN 6563, Valeoti Martii Narniensis de incognitis wulgo ad serenissimum Hungarie et Bohemie regem Mathiam liber inchoat Prohemium in qua ostenditur ex gratia divina esse scientiam. The Prohemium opens: "Quamdiu omni-(um) fere disciplinarum iterum atque iterum codicibus pertractatis tempus esse videtur ut aliquid longo studio multisque laboribus in medium adducamus . . ." (fol. 1r). At fol. 2r, the first chapter opens, "Inter theologos cristiane secte et philosophos veteres . . ." The work ends at fol. 80r, ". . . longo tempore intra limites suas maximus eorum exercitus continuerit." For its headings see Appendix 58.

[46] *Ibid.,* fol. 79v.

[47] *Ibid.,* fol. 75v, while at fol. 79v he is pronounced superior even to Lorenzo.

[48] See caps. 2, 6, 8, 12, 15, 24, 27.

Peter of Abano.[49] Chapter one takes up the differences of opinion between theologians and philosophers concerning first matter, chaos, form, "and many other things." Chapter two deals with the *intellectus agens et possibilis* and reproves the great error of the Stoics in this regard. Chapter three emphasizes the necessity of religion, because of varying human opinions and because of Averroes' theory of the unity of the intellect. Chapter four affirms that the immortality of the soul cannot be proved philosophically and must be taken on faith. The fifth chapter then inquires what faith is, in what things it consists, and whether a person who had no knowledge of Christianity could be saved by faith.[50] The sixth chapter asks what reasoning led the philosophers to say that in God there is father and son and a certain medium, which (three) we call the Trinity. The seventh chapter asks for what reason man is said to be made in the image and likeness of God, when image and likeness are two different things. After two chapters on the thorny topics of the Trinity and adoration of images,[51] the tenth asserts that ignorance is the greatest sin and that every sin is from ignorance, even in the case of those who know they are sinning. Galeotto also devoted a chapter of the *De doctrina promiscua* to this contention that the crime of ignorance is the greatest sin.[52] In *De incognitis vulgo* after three chapters discussing happiness[53] Galeotto confutes Lactantius's denial of the earth's sphericity and the possibility of antipodes and an error of Duns Scotus with reference to predestination. There follow chapters on virtue, human prayers, the intercession of Christ and the saints, and the

[49] Written in 1303.

[50] This is a long chapter extending in BN 6563 from fol. 8v to 17r.

[51] *Ibid.*, fol. 21r-v, "Quomodo operatur trinitas si tota simul vel si divisim ubi quedam similitudo gentilium cum observatione cristiana enumeratur." Fol. 23r, "Que adoratio debeatur trinitati ubi et latria et dulia et hiperdulia declarantur et que obligantur scientie adorationum genera (?) et quod non peccatur in adoratione imaginum."

[52] Ed. of 1548, cap. 26, pp. 246-254.

[53] BN 6563, fol. 29r, cap. 11, "Disputatio an in hac vita possit esse letitia et tandem declaratur quod nemo possit letus nisi bonus"; fol. 30r, cap. 12, "Que differentia sit inter theologos et philosophos de beatitudine"; fol. 31r, cap. 14, "Que differentia sit inter catholicos et philosophos de aquirenda beatitudine."

question whether those who know they are damned are obliged by philosophic reasoning to pray and praise God.

Then come a half dozen chapters having more relation to astrology. One asserts that life can be neither shortened nor lengthened and that it lasts only so long as is given from above, but that even so it is necessary to have doctors and medicine.[54] Another declares that in human affairs nothing is in our power but all from the stars depending on God, and discusses the geniture of Octavianus or Augustus Caesar.[55] A third confutes the argument of Augustine against astrology from the case of such twins as Esau and Jacob.[56] A fourth denies that the Magi who came to Christ were kings and shows where mention is made in pagan authors of the comet which conducted the Magi.[57] A fifth discusses the distance of the firmament from the earth and how many thousands of years it will take all the heavens to return to their original position, if they move fifty miles a day.[58] Galeotto then reverts to other matters, holding that men of letters should not receive food or raiment for their learning, aid, or counsel, asserting that Aquinas's theory of almsgiving is open to criticism, affirming the superiority of Christianity to Judaism and paganism, and protesting that his entire book is subject to the Catholic church.

The miscellaneous and rambling character of Galeotto's thought in the *De incognitis vulgo* becomes still more pronounced in the well named *Promiscuous Doctrine* whose title fits it much better than was the case with the other work. Astronomy and astrology, and medicine and pharmacy seem, however, to be the fields to which most attention is given. The opening chapter asserts that men's names are imposed by the stars; in the second an astrological interpretation is given of the transformation of Jupiter into a bull; in the thirteenth the humors of the hu-

[54] BN 6563, fol. 45v, cap. 20.

[55] *Ibid.*, fol. 52v, cap. 22.

[56] *Ibid.*, fol. 57r, cap. 23.

[57] *Ibid.*, fol. 63v, cap. 25. Cap. 24, fol. 62r, was to the effect, "Quot prophete plerumcque vident minas et non effectum rei ut de innocentibus pueris et ubi fit mencio in historiia de hiis."

[58] *Ibid.*, fol. 64v, cap. 26.

man body are related to the planets; in the fourteenth the metals and diseases and spirits (i.e., of the human body) are all related to the planets, Peter of Abano's *Conciliator* being followed on the last point. Chapter sixteen deals with radical humidity, the three Fates, and the character of the star of Venus; chapter twenty-one tells what constellation produces lovers of fables. The omnibus twenty-second chapter treats again of the spirits, why joy and fear kill suddenly, why the blood of the corpse flows in the murderer's presence, why Juno signifies the powers of the air, and of the entry of the sun into the sign Aries. Magic we are told regards some of the spirits of the air as good, while Christianity holds that they are all bad. The next chapter inquires whether number has any operative power and treats of the errors of the Pythagoreans. Chapter twenty-four deals with astrological images to cure diseases which the author defends against objectors but feels that he needs the aid of Lorenzo de' Medici in this. Chapter twenty-five discusses a number of astrological matters with much citation of Albertus Magnus and Thomas Aquinas. The moon and tides, size of the sun, and why mathematicians begin the day at noon, are among the themes of chapter thirty. The following eight consecutive chapters are all primarily astronomical or astrological, treating of such matters as the diversity of the signs of the zodiac and division of the year, the predictions of an anonymous author, the altitude of the planets, their aspects and the years of our life, why the signs of the zodiac have animal names, of various constellations (and the game of cards!), dawn and sunset, the sun's deviating from the zodiac by miracle and the fable of Phaëthon. In the medical and pharmaceutical chapters Galeotto discusses poisons a good deal, including those which act after a long time.[59] He regards Pliny's attack on compound medicines as ridiculous. He also ventures to point out some errors in Galen's works, but they are those already noted by Peter of Abano, Averroes, and Avicenna. A chapter is also devoted to errors of

[59] Ed. of 1548, cap. 12, p. 101.

the last-named. On the whole the work seems a disorderly compilation or haphazard setting-down of the author's miscellaneous fund of learning, in a manner intended to amuse rather than to instruct, and with nothing new—the erudite hodge-podge of classical allusion, anecdotes, bits of science and philosophy, touches of criticism, which the early modern centuries were to regard as more "human" than the regular procedure of scholastic method. For us the faith in magic, spirits, and extreme astrology is the most noteworthy feature of both works, though a certain boldness is shown in venturing on theological questions and in emphasizing the errors of great authorities.

Lorenzo Bonincontri di San Miniato combined astrology with history and poetry rather than with medicine. Born on February 23, 1410, he was adduced as an example of green old age by Lippo Brandolini in his *De humanae vitae conditione* addressed to Matthias Corvinus, king of Hungary 1458-1490, and his queen Beatrice. Lippo speaks of Bonincontri as a most eminent astrologer now in his eightieth year but vigorous in mind and body so that he remembered what he had learned as a boy and made all his journeys on foot.[60] Tiraboschi argued that he probably died before the end of the century and certainly before 1502, since in that year passed away Pontano who had written an epigram upon Bonincontri's death.[61] Pontano, however, did not die until 1503.[62] But the fact that Bonincontri, who had addressed the first three books of his long poem on *Things Divine and Natural* to Lorenzo de' Medici,[63] in the later

[60] "Laurentius Bonincontrius astrologus praestantissimus octogesimum nunc ut reor annum agit tanto animi corporisque vigore ut et meminerit quae puer didicit et pedibus semper iter faciat." I quote from the Basel, 1543, printed edition, *De humanae vitae conditione et toleranda corporis aegritudine ad Mathiam Corvinum Hungariae et Bohemiae regem et Beatricem reginam dialogus*, p. 73.

[61] Tiraboschi, *Storia della letteratura italiana*, VI, i (Milan, 1824), 597-602.

[62] C. M. Tallarigo, *Giovanni Pontano e i suoi tempi*, Napoli, 1874, I, 348-349. But while Tallarigo puts Pontano's death in the middle of autumn and in the same month when Alexander VI died, Eubel II, 22, puts the pope's death on August 18.

[63] Tiraboschi speaks of only three books of the *Rerum naturalium et divinarum sive de rebus caelestibus*, written in hexameters, but Giov. Carbonelli, *Sulle fonti storiche della chimica e dell' alchimia in Italia, tratte dallo spoglio dei*

part of the work addressed to "Ferdinand, king of the Spaniards,"[64] praises him for having driven the French from Italy[65]—this fact seems to indicate that Bonincontri wrote the last part of the poem after Gonzalo de Cordoba's victory on the Garigliano in December, 1502. Bonincontri also wrote a prose commentary upon the poem and in it refers to Portuguese trade with the antipodes,[66] a passage which would hardly have been written until after Vasco da Gama's return in September, 1499. Perhaps Pontano's epigram—he composed one on himself—was prepared before the event of Bonincontri's death. It may seem in-

mss. delle biblioteche con speciale riguardo ai codici 74 di Pavia e 1166 Laurenziano, Roma, 1925, p. 36, reproduces the illuminated title page of a Vatican manuscript of the poem containing six books: Vatic. Urb. 703, De rebus naturalibus et divinis distinctum in sex libris. Laurentii Bonincontri Miniatensis Rerum naturalium et divinarum ad Ferdinandum Aragonum inclitum Sicilie regem liber primus feliciter incipit: "In nova tentantem deducere carmina musas. . . ." But in another Vatican manuscript which I have examined this verse occurs in the middle of the manuscript after the completion of the first three books addressed to Lorenzo de' Medici: Vatic. 2844, fol. 56r, where we read:

In nova tentantem deducere carmina musas
Atque aperire viam verae rationis et artis
Te regem ferrande precor iustissime princeps
Qui quondam tanto bellorum turbine pressus
Invicta fortune ictus virtute tulisti
Flecte animum vatemque tuum ne desere. . . .

In this manuscript the word, "divine," precedes "natural" in the title, fol. 1r, "Laurentii Bonincontrii Miniatensis rerum divinarum et naturalium liber primus ad Laurentium medicem florentinum," and the poem opens: "Carmine prima novo mundi simulacra iacentis. . . ." At fol. 15r the first book ends and the second begins; at fol. 33r occurs the transition from the second to third book; at fol. 55v the third book ends, "Laurentii Bonincontrii Miniatensis ad prestantissimum virum Laurentium medicem rerum divinarum et naturalium liber tertius et ultimus finit."

Erasmo Pèrcopo, "Luca Gàurico, ultimo degli astrologi," Società reale di Napoli, *Atti della r. accad. di archeologia, lettere e belle arti,* XVII (1893-1896), 24, notes that Gauricus edited the three books *Rerum naturalium et divinarum* of Bonincontri at Venice in 1526, and thinks that the work was dedicated to Ferdinand before 1474.

[64] Vatic. 2844, fol. 72r, "Laurentii Bonincontrii Miniatensis de stellis ad Ferdinandum Hispaniarum regem. Inclite rex, vatem. . . ." I am not sure that the "Ferrande" of the above verses to whom the preceding section (fols. 56r-71v) seems addressed may not denote Ferrante—i.e. the Ferdinand of Aragon who died in 1494, and not Ferdinand the Catholic.

[65] Vatic. 2844, fol. 107r, ". . . Italia gallos iecisti." Soldati (1906), p. 162, interprets that to refer to John of Anjou's (1459-1464) defeat.

[66] Vatic. 2845, fol. 124r.

credible that the poet continued his literary productivity after his ninetieth birthday, but we shall presently note evidence that he was alive in 1493 and 1497 at least. Soldati would therefore seem mistaken in affirming that Bonincontri died in 1491, and that there is no notice of him later than that year. However, it must be noted that his contemporary, Paolo Cortese (1465-1510), spoke of him as recently deceased in his *De hominibus doctis,* dedicated to Lorenzo de' Medici.[67]

At the age of twenty Bonincontri had left his native San Miniato as a result of having shared in the conspiracy of 1432 to throw off the yoke of Florence.[68] He joined the emperor Sigismund and then served for some time in arms under Sforza at Pisa. Next he went to Naples where he was well received by king Alfonso and remained there from about 1450 to 1475. Soldati appears to have demonstrated conclusively that he did not teach at Naples but merely collated his corrupt manuscript of Manilius with a superior text there. He also made the acquaintance of Pontano. In 1458 king Alfonso died and Bonincontri lost his wife and two of his sons in a pestilence which he ascribed to the baneful influence of two comets.[69] We further learn from a passage by Pontano that Bonincontri made some employment of astrological images while at Naples. Pontano states that his companion, Laurentius Miniatus, had cured a friend of his who suffered from daily headaches by a gold image of a bull, impressed when the first degree of the sign Aries was in the ascendent with Jupiter constituted there and no rays of unlucky stars striking it but the moon and Venus in friendly aspect.[70] At some time during his life he saw military service with Ferdinand of Aragon.[71] In 1475 he was permitted to re-

[67] Benedetto Soldati, *La poesia astrologica nel quattrocento,* Florence, 1906, p. 129. Paulus Cortesius, *De hominibus doctis,* Florence, 1734, p. 54, "Laurentius Miniatensis qui nuper obiit. . . ." This passage does not seem to be noted by Soldati and Tiraboschi.

[68] In Vatic. 2845, fol. 41r, he speaks of having been an exile for almost fifty years.

[69] Soldati (1906), pp. 122, 124.

[70] The Latin of the passage is given by Soldati (1906), p. 134, from Pontano, *Commento alle cento sentenze di Tolomeo,* I, sent. 9.

[71] Vatic. 2845, fol. 63r, "Captat benevolentiam et actentionem ab invictissimo omnium rege Ferdinando Arago-

turn to Florence,[72] where he lectured on the Latin astrological poet Manilius in that year and the two following.[73] His poems include *Fasti* in Latin verse and the *Atlante* in *ottava rime*. His historical works include Latin annals from 903 to 1458 A.D.,[74] a history of the kingdom of Naples from the time of Robert Guiscard to 1436,[75] and a life of Sforza excerpted from his *Annals* dedicated to cardinal Ascanio Sforza two years after the death of Costanzo. About 1479 he entered the service of Costanzo Sforza, youthful despot of Pesaro and condottiere for Florence in the war with Ferrara, as his astrologer together with Camillo Lunardi.[76] After Costanzo's death in 1483, Bonincontri came to Rome, being reduced to financial straits, where the patronage of cardinal Raffaele Riario enabled him to print his commentary on Manilius in 1484, and where he occupied the chair of astrology at the university and received the laurel from the local college of poets.[77] Astrological predictions for 1485, 1486, 1488, 1489, and 1491 are extant in print.

Of Bonincontri's further astrological compositions the Laurentian library of Florence contains a commentary on the *Centiloquium* of Ptolemy which was transcribed in 1477 and so

nio Neapolitanorum rege quem tot bellis vexatum numquam animo concidisse vidit quod fidentius id facit quia apud eum militaverit et vera esse vidit que scribit uti in sua historia intexuit."

[72] G. Uzielli, "Assoluzione di Lorenzo Bonincontri dalla condanna di ribellione e sua abitazione in Firenze," *Archivio storico italiano*, XXIV (1899), 92.

[73] As he himself says in his commentary upon Manilius, printed at Rome in 1484.

[74] Muratori, *Scriptores*, XXI, published only the portion from 1360 to 1458. A manuscript is Riccard. 864, cod. chart. 17th century, Bonincontri Laurentii Samminiatensis Annalium libri. Soldati mentions another, also of late date: Magliabechiano-Strozziano XXV, 559.

[75] Lami published the first seven books coming down to 1348 in *Deliciae eruditorum*, Florence, 1739, vols. 6, 7, 8. Soldati (1906), p. 138, alludes to a tenth book on events after 1436. Riccard. 865, *Historiae utriusque Siciliae*, is a 17th century paper manuscript. Valencia Bibl. Univ. 257, 237 fols., is a 15th century copy. Other MSS are Naples V.G. 37 and XIV.F.3.

[76] Soldati (1906), p. 127.

[77] These events are attested by passages in Bonincontri's own works which will be found cited by Soldati (1906), pp. 128-129. See also the passage from the introductory letter to cardinal Ascanio Sforza of which the Latin text is reproduced by Soldati (1906), pp. 138-139, from a Paris manuscript of the *Vita Sforciae*, BN 11088. For his annual astrological predictions see GW 4908-4912, or Hain 3632-3635, Reichling 1689.

could not have been composed later. In the same manuscript are excerpts by Bonincontri from the *Quadripartitum* and Haly's commentary, and an anonymous compilation concerning physiognomy which may possibly also be by Bonincontri.[78] In the Biblioteca Este, according to Tiraboschi, are a commentary on Alchabitius, a treatise *De vi ac potestate mentis humane animaeque motibus et eius substantia* which is psychological and philosophical rather than astrological,[79] and astronomical tables for the year 1480, compiled together with Camillo Lunardi da Pesaro when they both were in the service of Costanzo Sforza. In a manuscript at Venice is his treatise in two books on the revolutions of nativities addressed July 31, 1491, to Giovanni Sforza, despot of Pesaro. It further contains his "Institutions of astronomy to express the nativity and the substance of the other parts of astrology," his "Most subtle aphorisms anent Interrogations," and the "Book of Elections," completed at Rome on May 12, 1489.[80] A manuscript at the British Museum contains the works on elections and revolutions. He describes the latter as his lectures on astrology at Rome in 1491 when he was eighty-two but then further dates it February 16, 1497.[81] His commentary upon

[78] FL Plut. 29, cod. 3, fol. 24, Laurentii Bonincontrii Miniatensis super Centiloquio Ptolemaei fol. 59, anon. Notabilia artis physionomiae secundum diversos auctores; fol. 62, Excerpta per me Laurentium Bonincontrii Miniatensem ex Quadripartito Ptolomaei et expositione Hali commentatoris sive Porphyri ex cap. I commenti. Another MS of his commentary on the Centiloquium is Vatican 3379, fol. 63.

[79] Soldati (1906), p. 137, describes it as a brief collection of definitions of the soul and its attributes according to the different schools of philosophers, and as a miscellany of little value.

[80] S. Marco VIII. LXXVI (Valentinelli, XI, 108), 15th century, fols. 1-62, De revolutionibus nativitatum libri duo, "Multos esse cognovi, princeps illustris Ioannes Sfortia . . ."; fols. 64-69, Institutiones astronomie ad exprimendam nativitatem et aliarum astrologie partium substantiam, "Exigit, vir amplissime ut plus . . ."; fols. 79-100, Anforismos ad interrogationes subtilissimas, "Nostre institutionis ordo exposcebat . . ."; fols. 100-111, Electionum liber, "Solent plerique per interrogationem factam. . . ." There is another MS of the last at the Vatican: Reg. Suev. 1115, 16th century, fols. 336r-343v. Of the *De revolutionibus* Soldati (1906), p. 143, mentions other MSS: BN 7417, 16th century, fols. 176r-221r: Vienna 5503, 1506 A.D., fols. 119r-160v.

[81] Arundel 274, paper, late 15th century, fols. 1r-67r, "Multos esse cognovi qui existiment non inspectis . . . / . . . Finis libri tertii et ultimi revolutionis annorum nativitatum et intronizationum quos ego Laurentius Bonincontrius

the astrological poem of Manilius is contained in a Vatican manuscript[82] and was also printed in 1484 and is catalogued in the Laurentian library at Florence. Lami noted a discussion of equinoxes by him in a Riccardian manuscript.[82a]

The four books of *Fasti*[83] set forth the solemn days of the Christian religion instead of the pagan Roman calendar and are filled with eulogies of "an infinite multitude of saints" and much reference to the movements of the heavenly bodies. The long poem was originally intended for presentation to pope Sixtus IV, and of the briefer poems in shorter metres with which it is interspersed one is every now and then addressed to that pontiff. His untimely death upset all Bonincontri's plans, and he laid aside the work for some years, fearing that the long labors which he had undertaken upon it had been all in vain. But when he heard that cardinal Giuliano della Rovere, the future Julius II, had in 1493[84] caused an imposing bronze statue of his paternal uncle to be erected, he decided, although by that time an octogenarian,[85] to put the finishing touches to his poem and present it to this filial descendant of Sixtus IV,[86] doubtless hoping to find in

Miniatensis ex pluribus collectis auctoribus in his libris collegi ad laudem et gloriam omnipotentis dei dum Rome ad lectionem astrologie conductus eram perfectus anno salutis 1491 et etatis mee anno 82. Finis die 16 Feb. 1497." Impress. sine anno aut loco; fols. 73r-86r, "Solent plerique homines post questionem . . . / . . . Perfectum Rome duodecima Maii anno incarnacionis 1489 per me Laurentium Bonincontrium astrologum et poetam." Impress. Noribergae 1539.

[82] Ottobon. 1706, In C. Manilium Commentarium.

[82a] Lami (1756), p. 259.

[83] The word is also spelled "fausti" in the manuscript of the poem which I have examined: Vatic. 8779, rubric, "Laurentii Bonincontrii Miniatensis ad Sixtum Quartum p.m. faustorum liber primus." Soldati has discussed this work more fully in his *Gl'inni sacri d'un astrologo del Rinascimento*, a work for which he gives no date though he often cites it.

[84] I take the date from L. Pastor's *History of the Popes*, IV (1898), 388. If correct, it contradicts Soldati's assertion that 1491 is the last known date in Bonincontri's career.

[85] He himself says in the preface that he is eighty years old. But, according to his statement elsewhere, he was already eighty in 1489.

[86] As he states in a prose preface prefixed to the poem and addressed to cardinal Giuliano in the Vatican manuscript. It opens, "Q. Varro, Iuliane presul dignissime, omnium sententia Romanorum doctissimus. . . ." The poem itself opens, following the rubric quoted above,

"Sume vocalem cithaeram beate
Sixte qui polles patribus verendis. . . ."

him the patron of whom he had been disappointed by Sixtus's death.

The poem, or two poems, as Soldati chooses to regard it, on things divine and natural is about equally religious and astrological in character and content. It includes such topics as that the causes of things are immobile but the effects varied by reason of the motion of the stars, the effect of the planets on men's conduct, how the stars operate in the generation of the babe, whether nature could be regenerated after a universal deluge.[87] Such usual religious topics are treated as the Trinity, birth of Christ, fall of man, and creation, while Milton's *Paradise Lost* is brought to mind by such themes as the speech of Lucifer to the bad angels, that of God to the good angels, and the order of battle of the bad and good angels respectively.[88] These Miltonic topics are in the fourth book, addressed to Ferrante. The conjunctions of Saturn and Jove at Noah's flood, at the birth of Christ, and at the rise of Mohammedanism, are noted,[89] but it is held that the mind of man remains free, although the force of the stars which man has to struggle against is immense.[90]

In the commentary upon the poem is found a very similar attitude. On the one hand we are told that the nature of the planet Mars is contrary to human life and brings wars, fevers, pest, and evil living;[91] or that the morals of the person in question will be according to the application of Mercury to the other planets,[92] while one born under the planet Venus will be lustful. On the other hand, the author leaves the difficult question of the relations between fatal disposition and divine providence to "our theologians" to determine and will gladly abide by any decision

[87] Vatic. 2844, fol. 7v, "Esse rerum causas immobiles sed varias astrorum motu earum effectus"; fol. 19r, "De effectu planetarum ad mores hominum"; fol. 22v, "De generatione infantis et quomodo stelle operantur"; fol. 28r, "An post diluvium fiat iterum rerum generatio consumptarum."

[88] *Ibid.*, fols. 65r-67r.

[89] *Ibid.*, fols. 122v-123r.

[90] *Ibid.*, fol. 124r,

"Ast hominum mentes nullo succumbere possunt
Incursu coeli vario sed libera cunctis
Est data mens. . . ."

[91] Vatic. 2845, fol. 127r.

[92] *Ibid.*, fol. 114v.

of the doctors of the right holy Roman church.[93] It would be interesting to know if this remark has any conscious relation to the condemnation of Pico della Mirandola.

[93] *Ibid.*, fol. 142r-v, the Commentary closes, ". . . Sed nos hanc questionem relinquamus nostris theologis terminandam quorum determinationi semper acquiescemus et sanctorum doctorum sacrosancte Romane ecclesie quibus (!) sit honor et gloria per infinita secula seculorum. Amen. Τελως."

CHAPTER LVII

COMETS AND COURTS

Since comets were long believed to have especial significance for kings, we shall in this chapter combine consideration of various treatises and predictions which were elicited by the comets of 1456, 1468, and 1472 with some indication of the astrological propensities of leading rulers of that period: the emperor, Frederick III, the dukes of Milan, Lorenzo de' Medici, and the kings of France and England. Several popes will also be involved in the prognostications to which the aforesaid comets gave rise.

In 1456 occurred one of the periodical appearances of Halley's comet which was noticed by almost all the chroniclers of the time[1] and observed in more scientific fashion by the famous Florentine astronomer, Toscanelli. The universities also took cognizance of it, as is seen in a *Judgment* based upon the comet which appeared through almost the entire month of June, 1456, written at the university of Vienna.[2] In a collection of fifteenth century astrological tracts from the library of the elector of the Palatinate, which treatises seem to be largely of German author-

[1] Ludwig Pastor, *Geschichte der Päpste,* I (1886), 552, note 3, citing Celoria, "Sull' apparizione della cometa di Halley avvenuta nell' anno 1456," *Rendiconti del R. Istituto Lombardo,* 2nd series, vol. XVIII (1885), 112-125. Celoria, however, does not collect references to the comet from the chronicles, but studies contemporary observations of it by Toscanelli preserved in a Florentine MS, Magliabech. XI, 121, fol. 246r, etc.

[2] Monasterium B.M.V. ad Scotos Vindob. 405, 15th century, fols. 109-118, "Tametsi plurimos et esse et futuros intelligam . . . / . . . omnium rerum conditore permutari solent cui sit laus. . . . Amen." Excerpts "a catholico et ex S. Augustino de eadem materia" follow to fol. 120.

Melk 59, 15th century, fol. 162 *et seq.*, has excerpts from the same or a similar work.

Other MSS are listed by Zinner 1201, 8500, 6151-6153.

For a brief letter on the comet by Peurbach, written at Wiener-Neustadt, 25 June 1456, with reference also to the comets of 1402 and 1433, see Albin Czerny, "Aus dem Briefwechsel des grossen Astronomen Georg von Peurbach," *Archiv für österreichische Geschichte,* 72 (1888), 298-300.

ship, is one on the comet of the year 56, by which that of 1456 seems to be meant.[3] Later in the manuscript is a prediction for the preceding year, 1455, in nine chapters dealing with the weather, conjunctions of the planets and eclipses of sun and moon, when to take medicine, disease, pest, crises good and bad, war and peace, religion, and the grain supply.[4] There also are judgments in verse and prose on the year 1465 and its conjunctions of Saturn and Mars, and of Saturn and Jupiter.[5]

It is said that two comets appeared at Rome in this same year, 1456, the latter of the two in June, and that pope Calixtus III, alarmed thereat, ordered prayers for some days to avert the wrath of God and bells to be rung to summon all to supplication against the tyranny of the Turks. It is true that in a bull of June 29, 1456, the pope ordered measures of this sort to be taken in that year against the Turkish peril; but how far he was influenced in this by the comets, whether as divine signs or astrological phenomena, does not appear. Pestilence raged at Rome and in the Turkish army, and there were earthquakes in Naples. Pastor, in his description of the papal bull, gives no hint of any allusion to the comet—nor is any found in the text of the bull as reproduced by Raynaldus—and remarks at the close of a long footnote that the silly statement repeated by Draper and Arago, that Calixtus had bells rung against the comet and excommunicated it, "is not worth refuting."[6] But the very different and much more moderate statement of historians from Hottinger to Friedrich[7] that the pope was alarmed by the comet he for some reason ignores. However, according to the contemporary account of Nicolaus e Fara the two comets were interpreted by John of Capistrano at Budapest as signs of Christian victory.[8] The previous humanist pope, Nicholas V, is said by Bzovius to have in-

[3] Vatican Palat. 1438, fols. 69r-71r, "De cometa anno lvi°."
[4] *Ibid.*, fols. 105r-115v.
[5] *Ibid.*, fols. 133v-134v.
[6] Pastor, *Gesch. d. Päpste,* I (1886), 553, note 1. For the text of the bull see Raynaldus, *Annales,* ed. Mansi, Lucca, X (1753), 67, col. 1-70, col. 1.
[7] J. H. Hottinger, *Historia ecclesiastica,* 1654, saec. xv, sectio I, p. 3; Johann Friedrich, *Astrologie und Reformation,* Munich, 1864, p. 20.
[8] Cited by Raynaldus, *Annales,* X (1753), 71-72.

stituted litanies to avert the calamities which some said would follow the earthquake and solar eclipse of 1448.[9]

In one manuscript excerpts from some judgment concerning the comet of 1456 are immediately followed by an account of the damage done by the earthquake in the kingdom of the two Sicilies.[10] The humanist, Giannozzo Manetti, addressed a work in three books to Alfonso V, king of Aragon, on the same theme.[11] In the first book he rehearsed various past authorities on the subject; in the second he gave a history of 210 past earthquakes;[12] in the third he stated the damage done by the two recent ones.[13] Noting that poets, historians, and theologians ascribed earthquakes to divine agency but that astrologers, natural scientists, and philosophers attributed them to natural causes, he conceded that some had been miraculous like Noah's flood and the eclipse of the sun during the crucifixion.[14] He thinks that those of 1456 equalled or surpassed all previous earthquakes which were natural and not miraculous.[15] Although he states that he was an eye-witness of these catastrophes, there is scarcely a single sentence of vivid description in his work. More marked is the pedantic flavor given by his insisting on employing the ancient classical place names except in those cases where only a modern name was known,[16] and by his attempt to use as many synonyms as possible for "was killed."

As a sign preceding earthquakes Manetti notes that birds keep fluttering or otherwise act unnaturally. A few days before the first of the recent disturbances a hen in the house of his most

[9] Bzovius (or Abraham Bzowski), *Annalium ecclesiasticorum . . .,* XVII, 37.
[10] Melk 59, 15th century, fol. 167.
[11] BN 6746, membrane, 1458 A.D., once the property of de Noailles, marshal of France, Jannosii Manetti de terrae motu libri tres ad Alphonsum Aragonum regem huius nominis quintum. It opens, "Duo quidam novi et inusitati, serenissime princeps. . . ."
[12] So he says at fol. 118v; I have not verified the count.
[13] This plan of the work is stated at BN 6746, fol. 3v. Book II begins at fol. 50r, Book III at fol. 86r.
[14] *Ibid.*, fols. 43v-48r.
[15] *Ibid.*, fol. 118v.
[16] *Ibid.*, fol. 86v, "Sed licet hoc predictum Sicilie regnum abolitis plerisque veteribus nuncupationibus vulgo alias divisiones appellationesque susceperit, nos tamen priscorum historicorum eruditissimorum et elegantissimorum virorum quam novorum modernorum et imperitorum atque infantium hominum vestigia sequi et imitari maluimus."

learned friend, Benedictus Ragusinus, imitated the crowing of a cock and, what was more marvelous, vanished completely thereafter.[17] Besides such acceptance of portents Manetti is favorable to the astrological interpretation of the earthquakes. One reason for his addressing a work on this subject to Alfonso is that that monarch's nativity corresponded with the dignity of the seismic phenomenon, so that it portended a great future for him, as we read in the cases of Jesus Christ, Alexander the Great, and Plato.[18] This prospect must have been mainly of posthumous fame, however, since Alfonso V of Aragon passed away two years after the earthquakes in the same year as our manuscript was written. Later on Manetti states that astrologers who are called *mathematici* by the populace think that all human affairs are governed by the stars even to particular events, not however so that men are forced against their will but that they are so inclined.[19] The opinion of Ptolemy, Albumasar, and all other ancient and modern astrologers as to earthquakes is that they are an evil effect of Saturn in certain signs such as Taurus, Gemini, or Aries. He then, however, dismisses the opinion of the astrologers as obscure, variable, and uncertain.[20]

Another contemporary work on the earthquake of 1456 by one who had both seen and felt it was that of brother Matthew of Aquila, professor of sacred theology of the order of Celestines.[21] After an introduction on the wonderful force of nature or more particularly the two luminaries, sun and moon, Matthew takes up first the causes, then the nature, and last the effects of

[17] *Ibid.*, fol. 37v.

[18] *Ibid.*, fol. 3r, "Ad hec accedebat fortunata ac fausta et felix nativitas tua que cum dignitate terremotus non immerito idcirco apparuisse videtur ut futuram maiestatis tue magnitudinem plane aperteque portenderet ceu de iesu christo et alexandro rege ac platone et de quibusdam aliis admirabilibus viris legisse meminimus."

[19] *Ibid.*, fol. 17v-18r, ". . . et ad fortunam prosperam vel adversam inclinentur, non ut omnino penitusque cogantur ne liberum humane nature arbitrium usquequaque tollatur."

[20] *Ibid.*, fol. 18v.

[21] Vatican Barberini 268, paper octavo, fols. 1r-33r. The margins are large and there are only fourteen lines of writing to a page. "Tractatus fratris Mathei de Aquila humilis sacre theologie professoris ordinis Celestinorum De causis atque natura comete et terremotus." It opens, "Sepe metum post illum tremebundum et periculo plenum motum terre quem iis diebus. . . ."

the recent terrible earthquake. Prominent among its antecedents was a comet which appeared five months previously on May 18th. Matthew then proceeds to devote so much space to comets that in the manuscript of his treatise which I used it is with considerable justification entitled, "Of the causes and nature of comet and earthquake." He believes that a comet is not merely a sign of coming evil but also a cause, by its hot and putrid vapors vitiating the air. The star of Bethlehem, however, he regards as miraculous and not a comet, which he explains with Aristotle as an exhalation of terrestrial vapors. He distinguishes three different comets in 1456, two before and one following the earthquake. As one of the signs immediately preceding the earthquake he reports that monks of a certain monastery heard mysterious sweet singing as of virgins and boys. He dates the earthquake on December 5 between the tenth and eleventh hour of the night before the dawn of Sunday, in the year 1456 during the reigns of Alfonso, king of Sicily, and Calixtus III, pope.[22] But he says nothing of the latter's being alarmed by the comets and issuing a bull in consequence. Mathew's astrological bent may be illustrated by his calling the sun "father of gods and men," adding that it may be so called no less in truth than in fable, if the other planets may be termed gods.[23]

William de Bechis of Florence, who in 1456 addressed his treatise on comets to Piero de' Medici, took up a more conservative religious position than Matthew, holding that comets were not causes but signs, in order, as he said, to save freedom of the will and not go against the Christian faith and religion.[24]

[22] This constitutes the closing sentence of the work: fol. 33r, "Fuit autem terremotus hic nonis decembris inter decimam et undecimam noctis horam ante diluculum diei dominice a nativitate redentoris 1456 sub indictione quinta imperante regno Sicilie serenissimo rege Alfonso presidenteque universali ecclesie sanctissimo domino nostro Calisto Tertio."

[23] *Ibid.*, fol. 2v, "paterque deorum non minus vere quam fabulose dicatur si cetera errantia sidera deos nuncupari liceret."

[24] Vatic. 4593, fols. 45-69r, Gulielmus de Bechis de cometa, "Cum ad Sancti Marci bibliothecam pergerem. . . ." The autograph MS, noted by Leonardo Ximenes, *Del vecchio e del nuovo gnomone fiorentino*, 1757, p. xcix, is Magliabech. XL.d.xi, paper, quarto, "Guilelmi Becchii Florentini Augustinensis

Of this William's work on spirits we have treated in an earlier chapter.

Simon de Phares mentions a prediction from a comet of 1465 at Paris by a Norman master, Perre de Graville. This Perre had been introduced to Louis XI because he understood how to make potable gold, having been a companion of the rector of Dijon who had made some for duke Francis of Brittany.[25] Possibly the date 1465 for the comet is a slip for 1456.

A comet of 1468 inspired an anonymous treatise of twenty chapters or questions, which is apparently addressed to pope Paul II.[26] These inquired as to the *quiditas* of this comet, whether comets ought to appear in 1468, whether the present apparition was a comet, and what kind of a comet it was. This involved a discussion of the various kinds of comets. It was next asked whence this comet was made and whether it was cause or effect. The differences between comets were then further considered, why they did not appear at all times, why more of them did not appear, and why they differed in form rather than had a single form. Whether they originated only from the five planets. That they were neither wandering nor fixed stars. That they did not appear in only one part of the sky. Whether they rose and set like the stars, and concerning the movements of the different sorts of comets. The treatise then turned in its last five questions to the significance of this comet of 1468 in general and in especial, what parts of the world it would affect, when these effects would begin, and how long they would last.

The author believes that this comet is composed of gross earthly vapor—the Aristotelian explanation of comets prevalent in the medieval period. His own observation has satisfied him that the phenomenon under discussion is a comet and not a fixed star. He holds that comets may be produced by the influence of

de cometa ad Petrum Cosmi de Medicis civem clarissimum die 15 Iunii 1456."

[25] *Recueil* (1929), p. 260.

[26] BN 7336, fols. 373r-379v, *De cometa,* opening, "Placuit beatissime pater adhuc aliquantulum. . . ." For the Latin of the chapter headings see Appendix 59. In the fifth line of the text reference is made to some cardinal.

the fixed stars as well as of the planets. However, he regards the year 1468 as a proper one for the appearance of a comet, because Jupiter, Mars, and the sun are together in the sign Taurus about the twentieth of June. In this connection he corrects the Alfonsine Tables, which located Mars at that time in the beginning of the sign Leo, whereas it really was in the end of Taurus, as he had tested.[27] The authority of Albertus Magnus is followed in several passages, but our author cannot agree with Bede that comets never move towards the south. Bede had used this assertion as an argument that the star which marked the birth of Christ could not have been a comet since it led the Magi south from Jerusalem to Bethlehem.[28] Leopold of Austria is cited twice in the latter astrological part of the treatise.

The comet of 1456 is recalled by our author, who places its appearance on June 6 before daylight in the fifth or sixth hour of the night. Its body was like a very clear and brilliant star. It was in the sign Taurus about the twentieth degree, declining from the ecliptic towards the north by nineteen degrees. Its tail was twenty-two degrees long. It was followed by great ills in many places, notably the defeat of the Turks at Belgrade and terrible earthquakes in Naples.[29] The present comet, too, is a sign of diminution of good in all things and terror to humanity. But our author is not very specific in this regard, limiting his prognostication to generalities such as penury, famine, wars, storms, and rain. Even so, his twentieth and last conclusion is followed by a correction of what has preceded which seems to be by the same person.[30] For example, to his list of places which will be affected by the comet he adds those subject to the signs of Cancer and Leo and specifies several European lands by name.

Another work on this comet, which appeared on September 22, 1468, in the city of Istropolis, or Pressburg, is preserved in manuscripts at Munich and Strasburg. It is addressed to Matthias

[27] *Ibid.,* fol. 373v.

[28] *Ibid.,* fol. 376v.

[29] *Ibid.,* fol. 377r.

[30] Thus he says (*ibid.,* fol. 379v), "Decimaoctava conclusio etiam alterabitur in parte sed non in toto, nam solum in eo quod dixi ad quas partes mundi effectus veniet."

Corvinus, king of Hungary, by his faithful servitor, Martin, archdeacon of Sora and canon of the church at Zagreb.[31] Presumably, he is the same person as the Martin of Ilkusz who was then connected with the new university of Pressburg. Of this Hungarian university Rashdall says: "Both the king and the archbishop, who concurred in its foundation, were much given to judicial astrology, and such fame as the university acquired was due to the astrological eminence of its masters."[32] Indeed, in founding the institution two of the professors, Martin von Ilkusz and the famous mathematician Regiomontanus, were commissioned to select a horoscope for the university which would assure it a splendid future, and it was initiated at the favorable time which they chose.[33] However good a mathematician Regiomontanus may have been, he proved an indifferent astrologer on this occasion, for the new university was of short duration. But this was by no means his only essay in the field of astrology, since he composed in the same year tables useful in finding nativities which he dedicated to the aforesaid archbishop of Gran.[34] He was also the first to print *Ephemerides* and proposed to edit such astrological classics as the *Quadripartitum* and *Centilo-*

[31] CLM 18782, fols. 208r-215r, "Iudicium de cometa qui apparuit anno domini milesimo quadringentesimo sexagesimo octavo vicesima secunda die Septembris in civitate Hystropolitana alias Posoniensi pro serenissimo principe et domino domino Mathia dei gratia Hungarie Dalmatie Croatie etc. rege compositum. Cum tuam noverim maiestatem, serenissime princeps, nil magis exoptare quam salutem tuorum regnorum. . . ." At the close is the date "die 6 Octobris," and then, "Eiusdem serenitatis tue fidelis servitor Martinus archidiaconus Sagrabiensis ecclesie etc."

Strasburg 111 (Latin 108), 15th century, fols. 17-27v. This Martin is, I think, not mentioned in V. Fraknoi, *Mathias Corvinus,* Freiburg, 1891.

[32] *Universities of Europe in the Middle Ages* (1895), II, 290.

[33] Herbert Schönebaum, "Die ungarischen Universitäten im Mittelalter," *Archiv. f. Kulturgeschichte,* XVI (1925), p. 55, "In Gran versammelte er die Erwählten, liess dort von den Professoren Regiomontanus und Martin von Ilkusz der Neugründung das Horoskop stellen, das eine glänzende Zukunft weissagte." Their astrological scheme is preserved in Vienna 24, 1467 A.D., fol. 212, "Figura coeli hora institutionis Universitatis Histropolitane."

[34] Regiomontanus, *Tabulae directionum profectionumque in nativitatibus multum utiles,* Augsburg, Ratdolt, 1490 (Hain *13801). Dr. Arnold C. Klebs, authority on incunabula of works of science, is of the opinion that the work was not printed in 1467, as is stated in my *Science and Thought in the Fifteenth Century,* 1929, p. 146.

quium of Ptolemy, Julius Firmicus Maternus, and the medieval compilation of Leopold of Austria. Of his correspondence with the astrologer, James of Speyer, we shall treat in the following chapter.

Of Martin's tract on the comet of 1468 some further account may be given. A prominent characteristic is the specific character of its predictions. At the very start before announcing his division into chapters Martin cannot restrain himself from announcing to king Matthias that the comet portends the death of the heresiarch claimant to the throne of Bohemia, George of Podiebrad. While Martin in his title dates the comet's appearance on September 22, he is also favorable to the contention of those who state that they saw it three days earlier on the nineteenth of the month, since on that day occurred a potent configuration of Saturn and Jupiter[35] which commonly is seen only once in nine years, although sometimes their retrogradation reproduces it again in the same year. The comet first appeared near the front paws of the Bear and then traversed the signs of Leo and Virgo. Martin's first chapter defines a comet as usual as a terrestrial exhalation and tells what constellations caused it. His second chapter tells by what planet it was governed, and the two remaining chapters enumerate the evils which it will bring. Throughout Martin makes much use of the *Quadripartitum* of Ptolemy. But that comets are death to kings Martin believes to be supported by experience as well as authorities. Thus after the comet of 1444 there were earthquakes in Hungary and Poland and king Ladislaus with many of his barons was overthrown and slain by the Turks. The comet of 1456 was similarly followed by earthquakes in Apulia and the deaths of king Alfonso of Aragon and Apulia and of pope Calixtus III. Later Martin notes how the comet of 1410 killed Wenzel and spread the Wycliffite heresy through Bohemia. The present comet threatens pope Paul II with death or at least sickness and danger in government. The astrological grounds for this conclusion are that the comet ap-

[35] CLM 18782, fol. 208v, ". . . tetragone saturni ad iovem redditio."

peared near Jupiter which governs spiritual persons, that it appeared in the tenth house of Paul's election, and that the sun at the time of the comet's appearance was in the same sign of the zodiac as at the hour of his coronation. Furthermore, the comet appeared in the ascendent sign of his geniture and the sign of his native land. Ills from the comet are also predicted for the emperor Frederick III, for Louis XI of France, for Casimir of Poland, for the kings of Apulia and Aragon, for the Turkish sultan, and for king Matthias himself. In some provinces the comet will produce a new sect similar in several of its ceremonies to the Jews. The effects of the comet will begin to be felt by January, 1469, and will probably continue until the January following with the worst calamities in July, August, and September, while the sun is in the signs traversed by the comet. The famous German astrologer, John Lichtenberger, informs us that he had composed a treatise at Speyer on the comet which appeared in Gemini on September 22, 1468, but it does not seem to be extant.[36]

The comet of 1472 seems to have inspired even more treatises than those of 1456 and 1468. John of Glogau in his astrological *Summa* spoke of it as "the great comet." It inspired Pietro Bono Avogaro to write a treatise on comets. It is generally dated in January, although we are told that when a comet appeared on February 21, 1472, certain astrologers predicted pestilence in consequence, but Francesco da Busto and Raffaele da Vicomercato reassured the duke of Milan on this point.[37]

Among the numerous treatises evoked by the comet of 1472 is one which John de Bossis, a Pole, wrote, apparently in Bologna,[38] where his name appears in 1471-1472 as lecturer on astrology, at the request of Nicholas, "bishop elect and confirmed of Nagy-Varad or Gross-Wardein and his lord."[39] Though not always

[36] Johann Lichtenberg, *Coniunctio Saturni et Martis, 1473,* was printed at Cologne about 1475: copy in the Pierpont Morgan library.

[37] F. Malaguzzi Valeri, *La corte di Ludovico il Moro,* I (1913), 189, citing Arch. di Stato, sezione storica, Miscellanea B. 14, Astrologia, alchimia, ecc.

[38] Since he says, CLM 23883, fol. 2v, ". . . ut notum fuit omnibus Bononie existentibus."

[39] CLM 23883, paper folio, legibly written, fols. 1r-7r, "Tractatus de cometa qui apparuit anno domini 1472 currente

strictly grammatical, John's treatise is otherwise well expressed and arranged. He first lists some twelve efficient causes of the comet which include positions of the planets on September 28, October 28, November 27, and January 10, but may be sufficiently illustrated by the first four. First was the conjunction of Saturn and Mars on August 12. Second was the position of the ponderous planets in a like *trigonus*. Saturn was descending in both its eccentric and its epicycle. Mars and Jupiter were descending in their eccentrics and ascending in their epicycles, while Venus "made precision with Saturn," descending in both its eccentric and its epicycle. A third thing to be noted as to the efficient cause was that in the aforesaid conjunction Mars immediately applied itself to the fixed stars. Fourth, there was a marvelous constellation of the planets on August 14, when Saturn, Jupiter, Mars, Venus, and Mercury were all in aerial signs and in a single aspect of friendship to the moon which was in a fiery sign.

Turning to the material cause of the comet, John dismisses "all the opinions true or plausible of the ancients and also the prolixity of moderns" who have written on the subject and briefly but clearly sets forth the usual explanation that comets are exhalations of terrestrial vapor which rise into the upper region of the air. He adds that the action of superiors or influence of the heavenly bodies so refines the gross terrestrial substance of the comet and so assimilates it to the nature of the sky that it is not quickly consumed but of a durable character. He here employs an alchemical analogy of *aqua ardens,* which as a result of repeated sublimation changes its character and becomes inflammable. The place of the generation of the present comet John locates in the fifteenth degree of Libra. It has a double movement, following the diurnal motion of the primum mobile but also the virtue of the fixed star whose nature first attracts it. Reasons for its varying velocity John finds in its attraction by

in diebus Ianuarii magistri Iohannis de Bossis Poloni. Cum igitur de naturis et stellarum proprietatibus et etiam ordine disertum sit . . . / . . . et consurgent falsificatores proditores et inventores aliarum religionum et sectarum."

fixed stars of the nature of Mars or Saturn in whose neighborhood its movement is retarded, but as it recedes from them, its velocity increases. A second factor is a force which it absorbs from its dominant fixed stars and planets[40] and which makes it rage and move with such velocity that John observed that, when it was in conjunction with the star Alzaurech and after the conjunction, it moved with great fury seven degrees in two days. He goes on to discuss its tail, course, and color. In its tail it resembled the species of comet called *pavo* but its nature was a cross between *miles, nigra,* and *tentaculum.*

Coming to the signification of the comet, John devotes a whole page to the pope. Those who have predicted his ruin did so more from augury, John thinks, than from a thorough examination of all the essential astrological factors. He concludes, however, that the supreme pontiff is in danger of diseases of the spiritual members from melancholy and phlegm and that he will probably have trouble with the infidels and can count on little secular support. The emperor should beware of danger to his life. As for the two kings of the north, John has already addressed other writings on the subject to the king of Poland based on the *Summa anglicana* (presumably of John of Eschenden), and the work of John of Cambrai and others. Predictions for France, Italy, the Turks, and other happenings in the air and on earth conclude the treatise.

To Matthias Corvinus of Hungary was addressed a judgment on the comet of 1472, apparently by the same Martin who had written him on that of 1468.[41] Martin is now, however, styled a parish priest of Buda rather than archdeacon of Sora and canon of Zagreb. The comet is dated on January 11, 1472, when there was also an eclipse. Between these predictions by Martin on the comets of 1472 and 1468 is an anonymous treatise on comets. They are followed by a prophecy concerning a comet "according to the school of Heidelberg," which we are informed in German

[40] CLM 23883, fol. 4r, "2° propter quandam virtutem sibi a stellis fixis et planetis derelictam et inbibitam."

[41] And in the same MS, Strasburg 111, fols. 1-8. Zinner 5117-5118.

was sent by the king of France to "our holy father, pope Kalixto," presumably Calixtus III (1455-1458). This adds another intimation to that scorned by Pastor that this pope was not indifferent to comets. Last is a prognostic on some recent solar eclipse of March 16, by a master of arts of Cologne.[42]

We learn from Simon de Phares of another prediction from the comet which appeared in 1472 on Saint Agnes' eve by Laurens Hutz, an astrologer and physician, who addressed his prognostication to Louis XI on returning to France from Rome where he had predicted the death of pope Paul II.[43] A third astrologer to forecast that pontiff's demise to the day was Perre le Lorrain who was put in prison for his pains and told that it would cost him his life, if his prediction turned out to be false. On the day set towards vespers the pope still appeared to be in good health, and Perre's friends visited him in prison to warn him of his peril. But he told them to await the hour; the pontiff died before the day was over; and Perre was released from captivity and heaped with honors. At least so Simon says.

Another treatise on the comet of 1472 was written by Angelo Cato de Supino of Benevento who styles himself "a philosopher and physician," and was printed the same year by Sixtus Riessinger at Naples.[44] It is addressed to the most reverend and most illustrious Don Juan of Aragon, son of king Ferdinand and protonotary of the Apostolic see,[45] but Cato presently states that he writes also for the glory of the university of Naples. On May 15, 1464, he had addressed a pest tract to the consuls of Benevento.[46]

[42] I have followed the description of the manuscript by Dr. Ernest Wickersheimer, in Tome 47 (1923), of the *Catalogue général des manuscrits des bibliothèques publiques de France: Départements.*

[43] *Recueil* (1929), p. 261.

[44] Fava e Bresciano, *La stampa a Napoli,* II, 13; Hain, *4706; Pellechet, 3404; two copies in the Bibliothèque nationale, Paris; one in John Ryland's library, Manchester, England; none in CFCB. I have used one of the Paris copies (BN Rés.R.1306) which was without page numbering or signatures. At the close is the date, "Prima Marcy M.CCCC.LXXII. ex Angelo Catone Supinate de Benevento philosopho et medico."

[45] "Reuerendissimo atque illustrissimo domino Don. Ioanni de Arrogonia sapientissimi regis Ferdinandi filio Apostolico prothonotario dignissimo Angelus Cato Supinas de beneuento philosophus et medicus."

[46] Rome, Angelica 1371 (T.5.9), paper, 15th century, in different hands and numberings of leaves, fols. 37-39, and

Toppi called him the physician of Ferdinand I of Aragon,[47] to whom as king of Sicily he dedicated an edition of the *Pandectae medicinae* of Matheus Silvaticus, printed at Naples in 1474. In the same year he edited the work of Guaineri on fevers.

This Angelo was, it is said, sent as an envoy to the Burgundian court by Nicola and Giovanni of Calabria, heirs of the house of Anjou, to solicit the hand of the daughter of Charles the Bold in marriage for either of them, but on their death he became physician and astrologer to Charles the Bold. Like Commines, however, who addressed his memoirs to Angelo, the latter soon left Charles for Louis XI, to whom he predicted Charles' death. He saved the French king from an attack of apoplexy in 1480, partly it would appear from having the good sense to open the windows and change the air as well as administer a clyster.[48] He was rewarded by the archbishopric of Vienne in 1482,[49] but encountered so much hostility there that he was unable to enter upon residence in his diocese, and, according to Simon de Phares, was lucky to escape with his life over the Alps. He retired to Rome and died in 1495 at his native Benevento. This was disputed against Moreri by Bayle, and by Michaud who follows him, on the authority of *Gallia Christiana* that Cato was buried in the cathedral at Vienne. But Bayle was unaware of the testimony of Simon de Phares, who had often conversed with Angelo and testifies to his astrological ability.[50] Bayle further took the pains centuries later in his *Dictionnaire* to discount the astrological or marvelous factor in Cato's prediction of Charles the Bold's

1-69r: "Angeli Catonis Subpinatis Beneventani philosophi et medici liber de epidemia ad consules Beneventanos feliciter incipit. Cum sciam me multum nostre R. P. debere magnifici consules . . ." It is dated at the end 15 May, 1464, "anno vi pont. Pii II et Ferdinandi regis invictissimi et tempore legationis D. Bartholomei Roborelli cardinalis Ravennatis apostolici legati in regno Austrie et in civitate Beneventi."

[47] Nic. Toppi, *Bibliotheca Napoletana,* Naples, 1678, p. 17. I owe the reference to Narducci's catalogue of the Angelica manuscripts.

[48] See Commines, *Mémoires,* Paris, 1924-1925, II, 280-281.

[49] In the letter to the cathedral chapter Louis XI speaks of Cato as his "medecin ordinaire maistre Angel Cathon Supino, de Benevent": *Lettres de Louis XI,* IX (1905), 257-258. Toppi regarded the physician and the archbishop as two different persons.

[50] *Recueil* (1929), p. 265.

death[51] and to question the credibility of other predictions recounted in an anonymous *Sommaire de la vie d'Angelo Cattho* which is printed with the *Mémoires* of Commines.[52] Commines further notes that Cato predicted from the stars that Frederick, prince of Taranto, would become king of Sicily and promised Commines a rent of four thousand livres in that realm as a consequence, but that twenty years passed before this prediction was at last fulfilled—in 1496.[53]

Cato was greatly impressed by the comet of 1472 to which he gave the name Pogonias,[54] affirming that none to equal it has been seen by mortals for the past fifteen hundred years. On the testimony of many witnesses he places its first appearance on January seventh rather than the eleventh as Martin of Buda did. He infers that the material of the comet—for which he accepts the prevailing theory of terrestrial vapor—began to conglutinate on January first. At first scarcely visible, by the eighth day it was the size of a star of the fourth magnitude, on the twelfth day of the size of a star of the second magnitude. By the fourteenth day it seemed almost as large as the moon and its tail appeared to sweep across a sixth of the sky. More accurately measured, however, it was some thirty-six degrees in length by four in breadth, and Angelo estimates that where the spheres of air and fire meet and comets circulate a degree is equivalent to about five thousand miles. Incidentally he informs us that the sphere of air has a greater thickness in the north than at the equator, while with that of fire the reverse is the case—an interesting extension of the common view that the spheres of earth and water were not concentric. The comet must have been visible to the entire habitable world. Angelo has no doubt that it forecasts great ills especially for kings and regards it as a triumphant vindication of the science of foretelling the future from the stars. Early in his treatise he exclaims in effect, "Be still ye who think

[51] See the graphic account from Jean de Bourdigné, *Chroniques d'Anjou et du Maine,* 1529, reproduced by A. Chéreau, "Les médecins de Louis XI," *Union médicale,* XVI (1862), 147-148. Bayle seems not to have known of it.

[52] In the edition of Paris, 1661, at pp. 759-765.

[53] Commines, *Mémoires,* III, 34.

[54] See cap. 4 of Cato's treatise.

the future foretellable only by familiarity with evil demons: Be still ye who urge that Christ forbade men to forecast times and seasons." To this he retorts that Christ's prohibition applies only to those events which God, the First Cause, put in his own power but not to those which he placed under the control of secondary causes, the planets. Nor is Angelo deterred by Aristotle's dictum that future contingents can have no determined truth. In his ninth chapter he draws five "natural conclusions" as to such effects of the comet as drought and sterility, winds, earthquakes, hot and dry sicknesses, wars, deaths of princes, and change in laws and religion. He argues that men's *complexiones* are altered by such an apparition and its attendant effects, and that their minds and souls are affected through their *complexiones*. In the tenth and last chapter after seven astronomical preambles Angelo draws twenty astrological conclusions as to further outcomes of the comet. But these, too, remain rather vague and general. For instance, to cite some of the more specific, the twelfth conclusion is that a great army will threaten from the east; the seventeenth promises the Jews persecution; the eighteenth warns a certain unnamed great prince to beware of being imprisoned by his brethren and of death. The last word is that God can change any or all of those ills threatened by the comet, if He so wills.

Henry Sutton wrote a very brief prognostication as to the phenomenon in the sky in 1472, and asserted that it was not a comet but a tailed or bearded star.[55] On the same page preceding Henry's prediction is another for 1472 by Jerome of Hereford[56] which, however, is based not on the comet, which it does not mention,[57] but upon the conjunction of all the planets in Libra "together with the sun in the tail of the dragon."

[55] BM Harleian 220, fols. 74v-75r: "Henricus Sutton. Ista stella duo sive. . . ."

[56] *Ibid.*, fol. 74v: "Anno domini MCCCC-lxxii^{do} secundum Romanos philosophus Jeronimus Herfordie ita decrevit de signo sequenti. In libra conveniunt omnes planete. . . ."

[57] The entry in the old printed catalogue of the Harleian MSS; Sententia sive iudicia astrologica Jeronimi philosophi et Henrici Sutton de cometa quae apparuit circa A.D. 1482," is thus doubly misleading, since the date is 1472, not 1482, and neither author professes to discuss a comet.

In a single manuscript at the Vatican[58] are three different tracts on the comet of 1472. The first is really a printed work, published at Rome in the year of the comet's appearance.[59] It is in six chapters. A frequently cited authority in this work is the little known name, Simusta, who must have lived in the fourteenth or fifteenth century, since he is said to cite Perscrutator.[60] Our author attributes the comet of 1472 to a conjunction of Mars and Saturn the previous year in the third degree of Gemini. He assures his readers that the comet will not injure pope Sixtus IV, "so far as the ascendent under which he was elected and crowned is concerned, because in dignities only the fourth is reached and not the first. But others who have Libra in the ascendent of their nativities should beware, since the greatest danger hangs over them." Neither this nor the two manuscript discussions[61] of the comet of 1472 seem to mention the name of their authors, but the catalogue ascribed one of them to Nicholas Hartman,[62] presumably the incunabulum which comes first. It is addressed to some "most reverend lord."

In the same manuscript, immediately following the printed work on the comet of 1472 and preceding an astrological work of Hermes and a treatise and judgment on weather prediction which are dated in 1469, comes a discussion by master Ralph of Rudesheim, licentiate in sacred theology, whether a comet which

[58] Vatic. Palat. 1438, paper.

[59] *Ibid.*, fols. 2r-8r, "Cum huius diei magni et horrendi comete recens apparitio mortalium corda perterreat . . . / . . . Iudicium de Comete qui hoc anno apparuit significatione et ceteris impressum Rome finit feliciter." 1472 is then added in red ink.

[60] *Ibid.*, fol. 3r, "sicut dicit Simusta allegans quendam fratrem qui se perscrutatorem appellat."

[61] *Ibid.*, fols. 40r-41v, "De generatione Trice seu Comete que anno Cristi 1472 in Ianuario apparuit. Vera et alta sententia philosophorum . . . / . . . Hec modo sufficiant de presenti cometa 1472"; fol. 42r-v, "De cometa qui anno 1472 apparuit. Cum omnium rerum in primordio creationis . . . / . . . se possit eruere in eternum. Amen. 1472." Yet another and briefer discussion of the comet of 1472, only a page in length, has been pasted into Vatic. 7806A, fol. 48r.

[62] The sole occurrence of this name that I observed in Vatic. Palat. 1438 was at fols. 172r-173v, where colored figures on fol. 172r-v and the accompanying text concerning eclipses in September and October on fol. 173r-v have been written vertically instead (like the remainder of the MS) of horizontally across the page. Written in the same way is the legend, "Nicolaus Hartman astrologus et medicus licet de minimis, 1465."

originates from the matter of the elements gives true signification of the death of a prince or other notable events.[63] Ralph also discusses other questions concerning comets, but does not seem to deal with the comet of 1472 specifically or primarily.

Yet another discussion of the comet of 1472 was by an author whose name was scarcely legible in the manuscript which I used but possibly may be deciphered as Laurentius Cerastius of Viterbo. Seven points are considered: what a comet is in kind, what name should be given to the present comet, in what sign it appeared, when its effects will begin to appear, what it signifies, how great the evils will be, and how long they will last. The author beseeches God to ward off all evil from his faithful and especially from Italy which this portent seems to threaten. One ill which it announces he forbears to state in writing lest it create a public scandal but offers to reveal it by word of mouth to any of his friends who may wish to know.[64]

Yet another judgment on the comet of 1472 is extant by master Valentinus Zathor. It is preserved in a manuscript of the university library at Cracow.[65] This comet also received the attention of an astrologer in the town of "Newmarckt" near Nürnberg, and with his judgment are preserved others concerning it emanating from Vienna and Erfurt.[66]

A good deal has been made by Celoria of the truly scientific character of observations by Paolo dal Pozzo Toscanelli of the comets of 1433, 1449-1450, 1456, 1457, and 1472,[67] which are

[63] Vatic. Palat. 1438, fols. 10r-19r, "Per egregium virum magistrum Radulfum de Ruddesheyn sacre theologie licentiatum. . . . Utrum stella comata ex elementorum materia sumens originem mortem alicuius principis aliorumque eventuum notabilium significationem habeat veracem."

[64] FN Magliabech. XI, 121, fol. 235r-v, opening, "Quoniam nonnullos res novas cupientes videre de comete nunc apparente aliquid brevius annotare constitui. . . ."

[65] Univ. Cracow 2496, DD.X.49, str. 155-164: "Iudicium et significatio comete visi a.1472 currente per magistrum Valentinum de Zathor diligentissime confectum." I have not examined this.

[66] CLM 3586, 1472-1475 A.D., fols. 255-260: De cometa anni 1472 ingenium per quendam astrologum prope Nuernbergam in oppido Newmarckt conceptum. Iudicia de eodem Viennense et Erfordiense.

[67] Giovanni Celoria, *Sulle osservazioni di comete fatte da Paolo dal Pozzo Toscanelli e sui lavori astronomici suoi in generale,* Milan, 1921, 76 pp. with fac-

preserved in a manuscript at Florence.[68] It is true that these notings of the positions and movements of anterior comets reduce the importance which has been ascribed to the observations made by Regiomontanus of the comet of 1472. But it must be remembered that long before these in turn we have such observations as those of Jacobus Angelus on the comet of 1402, or of Geoffrey of Meaux on those of 1315 and 1337. Such activity, moreover, was paralleled in another way in the repeated issues of astronomical tables from the Alfonsine on. It would be ill-advised therefore merely to replace the Regiomontanus myth by a similar adulation of Toscanelli, until the superiority of his astronomical measurements has been actually demonstrated by comparison with the numerous examples to be found in previous manuscripts. This has not yet been done, Celoria giving us simply a detailed study of Toscanelli's own observations.

Celoria recognizes that previous writers have given an incorrect impression of Toscanelli's attitude to astrology,[69] and that the utterances of Marsilio Ficino and the two Pico della Mirandolas[70] from which this impression was received are in open contradiction with Toscanelli's manuscripts. Ficino is quoted as affirming that the most eminent astronomers have neglected judgments, giving as an example Toscanelli who used to smile at them and, when he was past eighty, examined his geniture and found no influence in it that would serve to explain such longevity.[71] Pico della Mirandola in his work against astrologers represents Toscanelli as always calling astrology uncertain and fallacious,

similes and tables; reprinted from G. Uzielli, *La vita e i tempi di Paolo dal Pozzo Toscanelli,* 1894.

[68] Magliabech. XI, 121, fols. 237r-258v.

[69] Celoria, *op. cit.,* p. 57.

[70] For the younger Pico's statement see Giovanni Francesco Pico della Mirandola, *De rerum praenotione,* lib. V, cap. vi, p. 541.

[71] Ficino's statement is given as follows by Celoria without page reference to his *Opera:* "Si agricultores ac medici in re certiore sepius predicendo falluntur, ceteros predictores sepissime falli quam fallaciam doctissimi quique astronomi deprehendentes iudicia neglexerunt. Mitto ceteros mihi etiam notos. Paulus Florentinus astronomus singularis hec ridere solebat qui et annos vite quinque super octoginta implevit suam tamen genesim diligentissime contemplatus nihil ad etatem conferens longam potuit invenire." The citation seems to go back to Ximenes, *Gnomone,* 1757.

and tells the same anecdote of his old age.[72] But Toscanelli's manuscript on the comets includes not only a prediction of Pietro Bono d'Avogaro on June 17, 1456, of the effects of the comet[73] but a similar effort of his own,[74] and yet other evidences of belief in astrological influence and significations. Celoria therefore concludes that Toscanelli was given to astrology in 1456, but that as time went on his scientific point of view triumphed, that he freed himself from the bonds of the pseudo-science, and before his death in 1482 attained the position which Ficino and Pico record.[75] This last is not, however, a necessary inference. As we shall see later in our chapters upon Pico and Ficino, their statements against astrology are not to be taken in too literal or extreme a sense. Opposition to astrology did not necessarily mean for them a denial of the influence of the stars or of a certain amount of prediction from celestial phenomena. Their anecdote about Toscanelli may not be true, and the rough statement that he neglected or questioned astrological judgments should not be interpreted in too strong or sweeping a sense. He may have expressed scepticism as to some of the more extreme astrological predictions then current and have criticized professional astrologers who were neither learned astronomers nor physicians, but his attitude of 1456 probably remained unchanged in 1482.

Angelo Cato's association with Charles the Bold and Louis XI suggests that the monarchs of this period were as much given to astrology as those of the previous century. Familiar is Ranke's portrait of the emperor Frederick III, who was represented by his contemporaries either weighing gems in a goldsmith's balance

[72] *Disputationes in astrologiam,* liber I, ed. of 1572, p. 418 (not 419, as cited by Celoria): "Paulus Florentinus in medicina quidem sed praecipue in mathematicis Graece Latineque doctissimus quoties de ista professione rogabatur toties eam incertam fallacemque asseverabat asserens inter caetera de seipso evidens experimentum qui cum quinque et octuaginta iam implesset annos in sua tamen genitura quam examinarat diligentissime vitalem nullam constellationem reperisset."

[73] Celoria, *op. cit.,* p. 21, publishes the text from fol. 237r of Magliabech. XI, 121.

[74] Celoria, p. 22; Magliabech. XI, 121, 238r.

[75] Celoria, p. 58.

or holding a celestial globe and discoursing with men of learning as to the constellations. The chief distinction in this respect between him and other monarchs was that he occasionally tried his own hand at predicting the future. He also dabbled in alchemy and pharmacy. "He believed in occult forces which rule nature and destiny." In 1444 at the castle of Nürnberg he was presented with *A Bee-Hive for the Correction of Public Affairs,* which is further described as "an astrological and mystical volume."[76] Its four books and numerous chapters, written in a turgidly rhetorical style and incomprehensible language, deal with the *Apocalypse* and antichrist as well as the zodiac. The relations of Lichtenberger and other astrologers to Frederick III will be brought out in our next chapter.

In Italy the court of Milan employed numerous astrologers. Tiraboschi mentions[77] a number who flourished under the last Visconti duke, Filippo Maria, who died in 1447. They were listed in Pier Candido Decembrio's life of that ruler.[78] In 1461 Raphael

[76] CLM 32, 15th century, membrane, 51 fols., 36 lines to the page, Alvearium ad corrigendam rem publicam Friderico Caesari castro Nurnbergico a. 1444 presentatum. Est liber astrologicus et mysticus. The MS once belonged to Hartmann Schedel and then to the elector of Bavaria. After the rubric, "Incipit alvearium in vini te solutionis secreti quarticipis serenissime maiestatis ut creditur opera compacti necnon quarumlibet aliarum rerum mirandarum eius occasione delectorum presertim in librum hystoricum primum arenga," the text opens, "Victorissime maiestati illustrissimo principi seu domino domino Friderico Romanorum regi. . . ." It closes, ". . . in vitam transire calamitatibus expurgatam. Explicit alvearium sub epistola sacra domino F. Ro. Re. futuro Cesari presentatum." Some of the more comprehensible chapter headings are: I, 1, "De hystoria corporali secretum huiusmodi concernente"; I, 2, "De hystoria animali pretextu premisse corporalis hystorie feliciter ad memoriam revocata"; II, 7, "De mirandis autorum diligentiis circa virtutum cultum habitis"; IV, 3, "De resolutionibus cum honestis preter Ethiopem extransactis et pendentibus quarti quadrantis"; IV, 5, "De resolutionibus successivis cum Ethiope."

[77] Tiraboschi, VII, 580. See also F. Malaguzzi Valeri, *La corte di Lodovico il Moro,* I (1913), 362-363; and F. Gabotto, *Nuove ricerche e documenti sull'astrologia alla corte degli Estensi e degli Sforza,* Turin, 1891, and MSS 717, 720, and 1329 of the Biblioteca Trivulziana. Between pp. 378-379 of Gabotto's work a plate reproduces an illumination from Trivulz. 1329 showing Raffaello da Vimercate presenting a horoscope to Galeazzo Maria Sforza (1461). It is also reproduced by Valeri, *op. cit.,* facing p. 378.

[78] Pier Candido Decembrio, *Vita Phil. Mar. Vicecom.,* cap. lxviii, quoted by I. Affò, *Memorie degli Scrittori e Letterati Parmigiani,* II, 152: "Astronomorum iudicio et disciplinae adeo credidit

de Vicomercato completed a book of judgments on the nativity of Sforza's son, Galeazzo Maria.[79] Years later Ambrogio Varese da Rosate (1437-1522) was court physician at Milan and made astrological predictions for its dukes. He also taught both at Milan and Pavia, and published *Monuments of Philosophy and Astronomy* at Venice in 1494.[80] A letter in Italian is extant in which Ambrogio replied to an interrogation of Ludovico il Moro, made at the request of Innocent VIII, that that pontiff would die, which happened within three days. Since Varese did not know the pope's nativity, he had to take into account the position of the stars at the time the interrogation was made. Thus we have the pope himself involved in that branch of astrology to which, more than any other, Christian objections were made as violating free will or depending on the moment of questioning, a matter of chance. Varese was also asked as to the character of the pontiff's successor but at the time of writing the letter had not yet had leisure to consider this further problem.[81] In 1475 the duke of Milan requested a John of Viterbo who was both a Dominican and a learned astronomer, and so presumably none other than Annius of Viterbo, to draw up a judgment as to the quality of times and single days of the coming year.[82] Incidentally, it may be noted in this connection that, according to Quetif and Echard, a Dominican named John Faber de Carvinio who died in 1477 discussed the question, whether signs appear-

ut peritiores eius artis ad se accersiret, eorumque consilio universa pene ageret. Habuit in primis Petrum Senensem et Stephanum Faventinum utrumque edoctum artis eius. Ultimis vero diebus principatus sui opera ac consilio Antonii Bernardigii, nonnumquam Aloysii Terzaghi, saepenumero Lanfranchi Parmensis usus est." None of the five is mentioned in the Index to Simon de Phares' *Recueil.*

[79] Tiraboschi, VI, i (1824), 581, citing a Trivulz. MS, Milan (now 1329), "Explicit liber iudiciorum in nativitate comitis Galeazzi Marie vicecomitis Lygarum futuri ducis dignanter electi quem Raphael de Vicomercato composuit. Finis 1461 die martis secundo mensis Junii hora octava precise." Argellati did not mention this Raphael. Gabotto (1889), pp. 398-399, prints a letter of September 2, 1474, from Raphael to the duke of Milan.

[80] Tiraboschi, VI, ii (1824), 699.

[81] His letter, dated at Milan, July 20, 1492, is published by Gabotto, *Rivista de filosofia scientifica,* VIII (1889), 382-383.

[82] "Uno iudicio de qualitate temporum et singulorum dierum anni futuri."

ing in the sky are to be feared, in an undated incunabulum entitled, *Compendiosa ex variis libris exhortatio.*[83] But I have been unable to find this work.

Lorenzo de' Medici was far from taking steps to discourage belief in astrology when he had the seven planets personified in a procession at Florence.[84] When Lorenzo reestablished the university of Pisa in 1472-1473, at first no provision was made for instruction in astrology. But the students soon petitioned for it, and it is interesting to note that the subject was first taught by a Dominican and theologian, Pagagnotti, who became a bishop in France[85] and who was opposed to the reformer Savonarola—who in his turn opposed astrology.

To Lorenzo, Benedetto Maffei addressed a brief work on agriculture which especially stressed the influence of the stars on agriculture and the importance of observation of the heavens and of the actions of animals in cultivating the soil and foreseeing the future.[86] The work includes various signs and presages, days to be observed, and magical procedures, similar to those of Pliny's *Natural History,* to protect the crops from worms, mice, and disease. One of these is to carry a red frog by night about the field and then bury it in the middle in an earthen pot. But it should be removed before harvest, or the grain may spoil.[87] The author, Benedetto Maffei, is described in the rubric as an apostolic abbreviator. He died at Rome in 1494. Fr. Scipione Maffei included him in his *Verona illustrata*[88] and claimed him as a member of the same family.

[83] Quetif et Echard, I, 856.

[84] See an undated incunabulum by Naldius Naldi in the Riccardian library, *Elegia in septem stellas errantes per urbem Florentinam curribus sub humana specie iussas a Laurentio Medice:* Hain 11672; Reichling, 1286.

[85] Fabroni, *Hist. acad. Pisanae,* 1791, I, 110-111, 327.

[86] BN 7483, 15th century, fols. 1r-28v. The old catalogue of the Bibliothèque du Roi describes it as, "Benedicti Maffei ad Laurentium Medicem breve compendium de futuris eventibus rei rusticae in quo describuntur signa ubertatis et penuriae et remedia noxiis ac presagia syderum." The illuminated rubric of the MS reads, "Magnifico viro D. Laurentio de Medicis Civi Patritio Florentino Benedictus Maffeus maioris praesidentiae abbreviator apostolicus salutem dixit." The text opens, "Scripturus ad te vir maxime atque doctissime exiguusque studiorum meorum munus exhibiturus. . . ."

[87] *Ibid.,* fol. 12r-v.

[88] Maffei, *Verona illustrata,* II (1825), 261-263.

Gems were employed as remedies in a vain attempt to ward off Lorenzo de' Medici's approaching death,[89] and various omens were noted as marking its occurrence.[90] Of another Italian ruler of the closing fifteenth century, Ercole d'Este, duke of Ferrara from 1471 to 1505, we are informed by a contemporary manuscript that during his later years he aroused discontent with his government because he lived a life of pleasure and occupied himself "with music, astrology, and necromancy, giving very scant audience to his people."[91]

In the old royal catalogue of manuscripts at Paris an astrological treatise is listed as by Arnoldus Paludanus, astrologer of Louis XI,[92] but in the manuscript itself the author speaks of himself as Arnoldus de Palude. In a note in French on the fly-leaf he is referred to as Arnault de la Palu.[93] This note is to the effect that he received through Matieu Beauvarlet, royal notary and secretary, the sum of 200 livres as his wages for the year ending the last of September, 1460. This is probably also approximately the date of Arnold's work which he says was composed at the request of John of Valois, count of Angoulême, *consobrinus* of the king. Since John of Valois (1404-1467) was a grandson of Charles V and in view of the date 1460 already mentioned, the king alluded to is presumably Charles VII, also grandson of Charles V, rather than Louis XI. In the body of the work Arnold gives an astrological example for the year 1445 and astrological figures and predictions for eclipses of 1437 and 1438.[94] These are perhaps to be taken as indications that his astrological activity reached back to those dates. Arnold lived into the reign of Louis XI, however, and very likely continued to serve him as his

[89] E. Armstrong, *Lorenzo de' Medici and Florence in the Fifteenth Century*, 1896, p. 309; unfortunately without reference to sources.

[90] *Ibid.*, pp. 313-315. And see our chapter on Ficino.

[91] A. Frizzi, *Memorie per la storia di Ferrara raccolte da Antonio Frizzi con giunte e note di C. Laderchi*, 2nd edition, Ferrara, 1847-1848, IV, 160.

[92] BN 7416, 15th century, fols. 66r-130r, Astrologia. The treatise opens, "Quoniam quidem, ut ait archiphilosophus Aristoteles in exordio primi libri de anima. . . ."

[93] *Ibid.*, fol. 65v. According to Chéreau, "Les médecins de Louis XI," *Union médicale*, XV (1862), p. 339, he was called Arnould des Marais as well as de la Palu or de Paludis.

[94] BN 7416, fols. 106r, 95r-96v.

astrologer.[95] He died in 1466 in the rue de la Mortellerie, Paris, of a pest which cost forty thousand lives.[96]

Arnold divides his treatise into three parts. The first is introductory, dealing with the subject of astrology and the natures of the signs and planets. The second part teaches the science of future things which happen in the "greater world" or macrocosm of nature such as the weather and fertility or sterility of crops. The last teaches the science of future happenings in the "minor world" or microcosmos of man, such as human health and natural inclination to virtue or vice, fortune or misfortune. In predicting for the human individual de Palude would note both the hour of conception and that of birth.[97] From the former are known the accidents which befall the babe while in its mother's womb and when it is born, and what will happen to it from its physical constitution and formation of limbs. From the latter are predictable "all the accidents which befall it after birth and until death." There seems to be little new in Arnold's treatment, but he at least draws a distinction between the views of astrologers in general and those of modern ones, stating anent revolutions of the year that "many astrologers, including practically all the moderns," follow a certain method.[98]

Finally may be mentioned Henry VII of England whose interest in astrology is attested by a de luxe manuscript containing the work of the thirteenth century astrologer, Guido Bonatti, and other astrological treatises. A miniature of the English king appears in the midst of Bonatti's text.[99]

[95] Chéreau, *op. cit.*, so lists him, but it may be merely on the supposed evidence of BN 7416 which he cites. Simon de Phares does not mention him in the *Recueil*.

[96] Chéreau, *op. cit.*, p. 339.

[97] BN 7416, fol. 109r.

[98] *Ibid.*, fol. 101r.

[99] BM Arundel 66, membrane, folio maximo. Bonatti's *Liber astronomicus* occupies fols. 48-249.

CHAPTER LVIII

ASTROLOGICAL PREDICTIONS: 1464-1500

This chapter will attempt to give some notion, rather than an exhaustive catalogue, of the numerous astrological predictions produced between 1464 and 1500.[1] Certain names, like John of Glogau, Manfredi, Avogaro, Arquato, and Lichtenberger will receive fuller consideration. Of some of the prognostications of this period we have had or shall have occasion to speak in other chapters. On the other hand, a few astrological treatises other than predictions will be included here.

Two or three predictions for the year 1464 have been preserved together in an astrological manuscript at Paris. One was composed in Pisa for Piero de' Medici by Antonius de Camera.[2] He takes into consideration eclipses of sun and moon and conjunctions of Jupiter and Saturn as well as the revolution of the year 1464 as marked by the entry of the sun into Aries at the vernal equinox. The prediction first deals with the weather, then with the crops, health and disease, war and peace, and the state of certain princes and cities. An Anthonius de Camera who was undoubtedly the same person as this Antonius was placed by Simon de Phares at Florence, where he regularly made annual predictions, of which Simon especially mentions that of 1462 and another for 1466, addressed to king Matthias of Hungary, rather than that of 1464 to Piero de' Medici.[3] There follows in the same manuscript another judgment for 1464 which is perhaps the work of John Nannius of Viterbo,[4] a Dominican who forged the lost works of Fabius Pictor, the oldest known Roman historian, and of whose other astrological activity we have had occasion to speak elsewhere. It comprises ten conclusions,[5] a number employed in another work by Nannius, although the conclusions are different. Mixed up with the prediction just considered in the foliation of the Paris manuscript are prognostications "concerning natural events" by a Petrus Verariensis or Verruensis, "venerable doctor of arts and medicine," for which a year is not given.[6] The nine chapters consider the state of the stars, that of the air or weather, health and disease, the sterility and abundance of the soil, peace and war, lords, climes, Italian affairs, and the significance of lunar eclipses. Just as the treatise of ten conclusions began before and closed after that of Petrus Verruensis, so in the same manuscript the work of Peter envelops prognostications by a master John of Speyer, doctor of medicine, pronounced at the university of Louvain and sent to Nicholas of Cusa in 1464.[7]

Although Simon de Phares did not especially note the prediction of Antonius de Camera for 1464, he did mention other

[1] Hellmann (1917), pp. 210-220, has listed alphabetically by authors the incunabula of such predictions and at pp. 221-222 given a chronological résumé. From the collection at Seville and other sources he has greatly added to the number to be found in Hain, but of course compiled his list too early to profit by such catalogues as GW and Accurti.

[2] BN 7336, fol. 365r-v. The judgment for the year seems to break off uncompleted at the bottom of fol. 365v, but the rest of it perhaps occurs elsewhere in this manuscript whose foliation has been confused. Another MS of it is at Rome, Alexandrina 102, 14th-17th century, fols. 50r-66r, "Iudicium astrologiae compositum super revolutionem anni 1464 in civitate Pisarum ad laudem dei omnipotentis et ad honorem Petri de Medicis ego Antonius de Camera brevi compilavi."

[3] *Recueil* (1929), pp. 260 and 261.

[4] BN 7336, fols. 366r-v and 371r. At the top of the first page is a heading of which I could not decipher the first two words which looked somewhat like "Nanto Nautis" or "Natito nautis." But possibly it should read: "Iohannes Nannius nomine ihesu christi olimphi locuturus astrologica veste." The text opens: "Superiora discurrere ea contemplando zelo et sapientie committendo. . . ."

[5] They are of this sort: "Conclusio prima. Dominus medii anni est Iuppiter." Conclusions 7 to 10 inclusive occur at fol. 371r, foreign matter intervening between the opening and closing leaves of our prediction.

[6] BN 7336, fols. 367r-v and 370r-v. It is entitled: "Prenostictiones preiudicate super naturalibus per magistrum Petrum Verruensem (Verariensem?) venerandum artium ac medicine doctorem. . . ." The text opens: "Volentibus in aliqua annorum mundi revolutiones futura contingentia. . . ."

[7] BN 7336, fol. 369v, "Expliciunt prenostica per magistrum Iohannem Spirensem (?), in medicina doctorem, pronunciata universitati Lovaniensi et per magistrum etc. de Busto transmissa reverendissimo in Christo patri et domino domino Nicolao miseratione divina tituli sancti Petri ad vincula presbitero cardinali ac episcopo Brixinensi etc. M°CCCC°Lxiiii." I am indebted to M. Omont, director of the department of manuscripts of the Bibliothèque Nationale, for this reading of the colophon.

prognostications for that year. Jehan Colleman of Orléans, an astronomer who in 1463 had published a treatise on the *primum mobile*[8] and had verified the positions of the fixed stars, based a judgment upon the great conjunction of Saturn and Mars on April 8, 1464, at about ten hours and eighteen minutes. He was in the service of Charles VII and Louis XI[9] and made astrological judgments in Flanders, of which this on the conjunction of 1464 was one. But from observing the moon too assiduously he was said to have become a thief—a sad case of planetary and astrological kleptomania. In the same year, 1464, Jehan du Locron and Jehan de Bosnia composed works on astronomical instruments, called respectively *Solitarium* and *Sexagenarius*.[10] Simon de Phares also ascribed to Jehan du Locron as prediction of a great mortality about that time, and to John of Bosnia an astrological treatise.[11] Before taking leave of 1464 we may note that in that year Nicholas of Swabia composed equations for the twelve astrological houses for the meridian of Florence,[12] while Lawrence Mandelkern wrote a chiromancy.[13]

On February 15, 1465, Regiomontanus addressed from Rome a letter containing problems in judicial astrology and arithmetic to James of Speyer,[14] an astronomer, or rather astrologer, in the service of the rulers of Urbino from whom it is hinted that he

[8] *Recueil* (1929), p. 259: *Super primum mobille,* with the incipit, "Pro intellectu habendo circulorum et polorum. . . ."

[9] Chéreau, "Les médecins de Louis XI," *Union médicale,* XV (1862), 339-340, found in the records that on February 27, 1467, Louis XI gave Colleman twenty-two gold crowns.

[10] *Recueil* (1929), pp. 259-260. I have ventured to alter Wickersheimer's reading from "Bosma" to Bosnia.

[11] With the incipit, "Tua me commovit celsitudo, illustrissime princeps . . ." the person so addressed being the prince of Nigrepont.

[12] Vatic. Barb. 350, fols. 91r-92v: "Opus Nicolai Alamanni pro equationibus 12 domorum celi ad Florentiam." At fol. 92v, col. 2: ". . . exempli gratia. Anno Christi 1464 currente ultima Aprilis in meridie ad Florentiam sol erit in 19 gradu tauri completo."

[13] CLM 916, 15th century, fols. 16-25. Other chiromancies which may date from about this time occur in Oxford, All Souls College 81, 15-16th century, fols. 202-213v, a translation into English by John Meteham from the Latin of Aurelian; fols. 240r-260, Flores by Johannes philosophus.

[14] For the exchange of letters between Regiomontanus and James of Speyer see Maximilian Curtze, "Der Briefwechsel Regiomontan's mit Giovanni Bianchini, Jacob von Speier und Christian Roder," *Abhandlungen zur Geschichte der mathematischen Wissenschaften,* XII (1902), 292-323.

draws a large stipend.[15] Regiomontanus had seen two figures of horoscopes drawn up by James and admired the precision with which they were executed and the passion for certitude and painstaking search for truth which they showed.[16] In his reply of April sixth James explains that his present position is astrological and does not permit purely astronomical or mathematical research.[17] He puts, however, some notable astrological questions to Regiomontanus. First he asks him to determine the year of Christ's birth from the virtue of the great conjunction which preceded it, also the year in which his doctrine could first naturally appear to the world, and how the success of Christianity could be foretold by astronomical causes. James premises that "our catholic faith" regards Jesus Christ as not only God but also true man, "who indeed as a true prophet in human form was known by remote peoples through a conjunction of the superior bodies by the law of the stars."[18] James further wishes to know the specific constellation which brought to Jesus so bitter a death, "since even he willed to be subject in body to the elements and other causes like any other man."[19] With reference to Dionysius the Areopagite's explanation of the eclipse at the time of the passion as miraculous, James asks on what day of the week and month it occurred. Finally, in connection with the conjunction of 1425, when he holds that the planets changed their *triplicitas,* he wants to know the precise time of the conjunction, its signification,

[15] *Ibid.,* p. 292, "presertim in astronomicis et arithmeticis quibus adeo vigilanter incubuisti ut dives stipendium a principe tuo suscipere merueris."

[16] *Ibid.,* p. 293, "Tanta enim libido certitudinis consequende te invasit ut ad tertia usque numerationem tuam extenderis. . . . Placuere mihi supra modum tanta solertie tue vestigia et veritatis inquisitio."

[17] *Ibid.,* p. 299, "Hic celum et astra non in se tantum perspecta sed eorum effectus considero. . . . Hiis enim doctrinis quas petis hic prorsus caremus ex quo scito nec mea problemata proponi posse nec tua dissolvi."

[18] *Ibid.,* p. 300, "Katholica fides nostra Iesum Christum dominum nostrum non solum deum sed et verum hominem universis credendum instituit qui quidem ut verus propheta sub humanitatis habitu per coniunctionem superiorum astrorum lege a remotis gentibus cognitus est." The allusion of course is to the three kings from the east.

[19] *Ibid.,* p. 301, "cum et ipse elementis ceterumque (ceterisque?) causis corpore subici voluerit tamquam alter homo possibilis (passibilis?)." The words in parentheses are my suggested corrections for the readings of Curtze.

whether the prophet to follow it has yet been born, the place of his nativity, and whether he will work miracles.[20]

These questions appear to be an illustration of the freedom and impunity with which astrologers then associated religious change in general and the career of Christ in particular with the courses of the stars. It is barely possible, however, that James of Speyer was trying to lure Regiomontanus into making a dangerous pronouncement or at least to put him in an embarrassing position. If so, he did not succeed, since Regiomontanus refused to be drawn into any detailed discussion of the influence of conjunctions, referring James to previous authorities on the subject. He made, however, little religious objection to James's premises, referring himself to "the virtue of the great conjunction which predicted and signified" Christ's advent, and merely remarking of the second question as to the cause of his painful death, "although that question may seem Gentile and alien to the Christian religion."[21] But he added that it depended on two things, namely, the great conjunction signifying the advent of so great a prophet and his nativity. He gave the day of the passion as Monday, April 11, which would seem bold enough. As for the conjunction of 1425, he denied that it marked a change of *triplicitas*, which had occurred rather in 1365, and therefore it did not signify the advent of a prophet. To find the time of the true conjunction Regiomontanus regarded as practically impossible, although he referred James to the tables of Bianchini.

The printed editions of the *Ephemerides* of Regiomontanus seem commonly to include astrological matter concerning changes of the weather, and selection of favorable hours for new undertakings, bleeding and pharmacy, sowing, planting, and cultivation of vines, or even for entering one's bath or having one's hair cut.[22]

[20] *Ibid.*, p. 301. The sentence which Curtze reproduces as, "Si hiis, quia stellis promissus est, sit natus, an si ipsum adhuc expectamus," apparently should read, "Si hiis (hic?) qui a stellis promissus est sit natus an si ipsum adhuc expectamus."

[21] *Ibid.*, p. 306, "Queris insuper que causa tam acerbam mortem salvatori nostro adtribuit, quamvis gentilis et a religione christiana alienus videatur sermo ille."

[22] Of two editions which I have examined Hain *13803 adds these last two topics to the others detailed in Hain

In the same manuscript with the group of predictions for 1464 are judgments for 1468 and 1469 and from the eclipses for 1469 and 1470.[23] Various cities of Italy are taken up, and the ills predicted include pestilence and, for 1469, a schism in the church.

Judgments for the years 1467 and 1470 are also preserved in another manuscript, now found at Florence. The former, either composed or copied by a priest, John Anthony Matthew of St. Stephen, in the name and place of his lord, Louis de Capofregoso, is addressed to a most reverend and most distinguished father and most clement lord, and affirms that princes as well as the stars are to blame for the misery of Italy and other lands which will characterize this present year, 1467, which the judgment carries to March 10, 1468.[24]

The prediction for 1470 states that it is the year 6800 since creation. First various past conjunctions are reviewed. We are informed that judgments and great orbs are still calculated from the conjunction which preceded the flood by 279 years. The fourteenth is now current and will run until 1659 A.D. But during 1470 no great accidents in the way of pest, famine, and the like will result from that conjunction. Another important conjunction in the beginning of Aries last occurred in 847 A.D., but its virtue is very great and durable. In consequence the outlook for the present year is bad for Poland, Hungary, and Scythia, and three great events will befall the mendicant orders, but no changes are signified for the elements. It is the seventh such conjunction since the creation and will last until the eighth begins in 1693 or 1697, after which will ensue the period of the eighth sphere, and there will be great religious changes, and many think that antichrist will then appear, as Methodius states in the book of illustrious men. Our author next adverts to the change of *tripli-*

*13704. A manuscript in which such astrological matter accompanies the *Ephemerides* is Prag 742, 15th century, paper, 31 fols.

[23] BN 7336, fols. 361r-v and 364r-v.

[24] FL Ashburnham 214 (146), paper, 15th century, fols. 1r-11v: "Reverendissime necnon prestantissime pater et domine clementissime . . . / . . . Scriptum per me presbyterum Iohannem Antonium Mathei de Sancto Stephano nomine et vice magnifici ac potentis domini d. Ludovici de Capofregoso necnon et domini mei singularissimi 1467."

citas in the conjunction of Saturn and Jupiter in 1384, to the recent minor conjunction of those two planets in 1464, to a solar eclipse last July of over an hour—a sign that its effects will be felt for more than a year—and to a recent conjunction of Saturn and Mars in Taurus. He then turns to determination of the lord of the year, to its nature in general, to prediction for the four seasons and their constituent months, and to a comet and fires. This completes the first part of the judgment. The second part deals with coming effects upon men and dwellers on earth with conclusions as to wars, fertility, pest and diseases—from which the year 1470 will be for the most part free, the conditions of persons and of realms—the emperor, kings of Poland and Hungary, duke of Milan, marquis of Ferrara, Bologna, Venice, and Florence. Finally, different professions and occupations are considered.[25]

Between these two predictions for 1467 and 1470 are given the arguments of master James de Zalesie of Poland against the false positions of master Bartholomew of Valencia concerning equations of days and their causes. As it happens, we also have the text of Bartholomew which Birkenmajer has printed from another manuscript. It appears that James and Bartholomew had engaged in a public disputation at Bologna, but that the audience had been so noisy and the discussion so violent, that each set forth his views in writing afterwards.[26]

The earliest known printed annual predictions seem to begin in 1470 or 1474 and to be by Dominicus Franciscus Guascono.[27] But we hear of others from Simon de Phares. Friar John, prior of

[25] *Ibid.*, fols. 24r-35r, opening, "Sapientum verbum est quod causas rerum inquirere volentes corpora celestia contemplari necesse est. . . ."

[26] *Ibid.*, fols. 13r-20r: "Rationes magistri Iacobi Zalesie Polonii contra positiones falsas magistri Bartolomei de Valencia de dierum equationibus et earum causis. Et licet iam cum magistro Bartolomeo de Valencia de positionibus suis super equationes dierum disputatio habita sit verum cum tumultu et astantium rumore obstantibus. . . ."

See also L. A. Birkenmajer, "De diebus naturalibus earumque aequatione. Ouvrage de Barthélemy Berp de Valentia, astronome du XVme siècle," *Bulletin international de l'académie des sciences de Cracovie.* Classe de philologie. Classe d'histoire et de philosophie (1912), pp. 339-379, especially p. 342.

[27] Hain 8134; Hellmann (1917), pp. 214, 221.

Bellefontaine, treated of some particular questions for the year 1469.[28] Dominicus de Dominicis of Venice, who became first a bishop and then, under Paul II, papal referendary, published such annual predictions year after year.[29] Jehan Anthoine de Belbelis, a citizen of Siena, addressed a prognostication for 1472 to the duke of Savoy. Jacques Rolhand, of the church of Notre Dame, Paris, was said to have predicted the famine of 1481 from the revolution of that year. Jacques Loste, who lived in Tours near the church of St. Gatien and was in the pay of Louis XI, predicted the frenzy of 1482 and made a judgment from the conjunction of Jupiter and Mars on January 10, 1486. Eustachius Candidus, a canon of Bologna, addressed a judgment on the year 1486 to king Matthias of Hungary. We shall say more of it presently. Simon Clades made a prognostication for 1492. Jehan Avis had composed almanachs for thirty-nine years before 1492, and Geoffrey de Saussay was another doctor of medicine who issued them annually at that time.[30]

Simon de Phares mentions Jehan Laet de Borchloen, "a surgeon quite erudite in revolutions of years," who had predicted successfully for the bishop of Liège and prognostications by whom for years between 1476 and 1491 are preserved in print.[31] Simon adds that Jaspart Layet, son of the aforesaid Jehan, made forecasts for the next bishop of Liège, Jehan de Horne, which had a large circulation in Flanders and were translated into French but badly.[32] Predictions by this Jaspart or Gaspard are extant for 1488, 1491, and into the next century. In the first he states that his father now feels too old to write and has engaged him to take his place.[33] Simon de Phares failed to note the *Prac-*

[28] *Recueil* (1929), p. 263.

[29] *Ibid.*, p. 262. Dominicus was made bishop of Torcello in 1448, was transferred to Brescia in 1464, and died in 1478. He taught philosophy for twenty-one years at Padua, became a papal protonotary in 1448, and apostolic referendary under Calixtus III rather than Paul II as Simon states. Ludwig Pastor, *History of the Popes,* III (1894), 273.

[30] *Recueil* (1929), pp. 263, 264, 262, 268, 266, in the order named.

[31] Hain 9827; Copinger 3463-3468; Brunet, III, 739.

[32] *Recueil* (1929), p. 267.

[33] Brunet, III, 739; Campbell, *Annales de la type néerlandaise au XVe siècle,* Nos. 1078, 1080. For a still earlier prediction by Jasper for 1485 in Flemish see Hellmann (1917), p. 215.

tica Parisiensis for the year 1483 of Conrad Rengart,[34] or the earlier *Prognosticon* for 1475 of Dominicus Franciscus Guascono, printed at Padua.[35] It was also at Padua in 1474 that John of Lübeck endeavored to predict the advent of antichrist by astrology.[35a]

The *Medicinal Astronomy* (*Astronomia medicinalis*) of Leonardus Qualea is not an astrological prediction but only astrological medicine, but may be noted here in its chronological order. It was composed between 1470 and 1475 rather than between 1457 and 1475 or about 1460, as some have suggested.[36] This year appears to have been favored—probably unconsciously—in order to push Qualea's statements as far before the voyages of Columbus as possible. But in the manuscript[37] the work is dedicated to master Henry Longard of Palermo, who is called in the preface a Dominican and professor of sacred theology, and archbishop of Acheruntia and Materanen. Since he held the last named post from 1470 to 1482, Qualea must have addressed this work to him in 1470 or at some time between that date and 1475, when we have Arnold of Brussels' signature

[34] Copinger 5110.

[35] Hain 8134.

[35a] Hain 10226. A MS is CLM 841, 15th century, fol. 39.

[36] P. Duhem, "Ce que l'on disait des Indes occidentales avant Christophe Colomb," *Revue générales des sciences pures et appliquées,* XIX (1908), 402-406; and *Etudes sur Léonard de Vinci,* II (1909), 325-327. See also *Isis,* "Queries and Answers," VI (1924), 533-534.

[37] BN 10264, fols. 57r-92v, or, including a figure to illustrate the aspects of the planets, 95r. On the front page, where we also read, "Suppl. lat. 38," then "Tom. I," and finally, written in pencil, "Bibliothèque Nationale de Naples V.B.32," is also pasted a piece of vellum, on which is written, "Explicit. Absolutus feliciter per Arnaldum de lishout de Bruxella in urbe Parthenopes 6 ydus Iulii Anno 1455." If this applied to our MS, it would indicate that Arnold copied it in 1455 rather than between 1475 and 1492. But even Duhem states that all the treatises in our MS were copied between the later dates by Arnold of Brussels and there are datings at the end of each to that effect. It would appear that the aforesaid fragment comes from another MS, presumably that of Naples indicated in the pencilled note. Furthermore Fava e Bresciano, *La stampa a Napoli nel XV secolo,* I (1911), 47, quote from the close of a Latin MS at Naples, "Absolutum feliciter per Arnaldum de lishout de Bruxella in urbe Parthenope 6 ydus Iulii Anno 1455." This Arnold was a printer at Naples as well as copyist. See further concerning him the work of Fava e Bresciano just cited and L. Delisle, "L'imprimeur napolitain Arnaud de Bruxelles," *Bibliothèque de l'Ecole des Chartes,* 58 (1897), 741-743.

to the *Astronomia medicinalis* in our manuscript.[38] Leonard appears to have composed this work in his later years, since he describes it in the aforesaid dedication as compiled from "many volumes of the Syrians, Indians, Arabs, Persians, Egyptians, Greeks, and Latins, which in the prime of life, while I traversed the whole world, I saw, perused, and often heard in many cases from masters."[39]

Since Duhem treated of only two chapters of Leonard's work, the third and fourth, it may be well to note briefly the themes of the others. Chapter one inquires what the men of old meant by the first cause. The second chapter asks what they thought concerning the world soul and the human soul. Chapter three investigates *yle,* chaos, the elements, their motion and that of the ether, by what cause the earth was uncovered by water, whence earthquakes proceed, islands and mountains rise anew and old ones are submerged—these last three points are the portions of this chapter treated by Duhem—why fountains burst forth anew and old ones dry up. Chapter five deals with the material sphere, its center, the axis of the sphere, the poles of the universe, the circles of the sphere, the line of the ecliptic, the eclipse of the luminaries, and with the milky way. Chapter six is about the two luminaries and five erratic stars and their motion under the zodiac. Chapter seven considers the signs and their *triplicitates.* Chapter eight treats of the natures of the planets, and chapter nine of the planets in the signs and their rule over days and hours. Chapter ten examines why the ancients joined astronomy (*i.e.,* astrology) to medicine and concludes that it was in consequence of prolonged experiments; also who the first medical authors were. Chapter eleven considers the general question of the subjection of inferior bodies to superiors and the universal influence of superior bodies on inferior bodies. Chapters twelve to fourteen take up the particular influence of

[38] BN 10264, fol. 95r, "22 octobris 1475 per A. de Bruxella."

[39] *Ibid.,* fol. 57v, "Compendiolum hoc quod astronomia medicinalis nuncupari videtur ex multis Syrorum Indorum Arabum Persarum Egiptiorum Grecorum atque Latinorum voluminibus que in florenti etate dum orbem totum lustrassem vidi perlegi pleraque sepius a magistris audivi."

the sky on the bodies of men, the special influences of the planets on the human body and the infirmities appropriate to each planet, and the relation of the twelve houses to the parts of the human body. Chapter fifteen is about the being (*esse*) and aspects of the planets and their conjunctions with one another. Chapter sixteen tells how to find out the strength and weakness of the houses and planets and which of them gains the ascendancy in the horoscope. Chapter seventeen directs how to draw up a horoscope. Chapter eighteen discusses whether it is right to investigate contingent events by the art of astrology (*per artem astronomiae*), the method of formulating the question, and the form and rule to be observed in judgments. Chapter nineteen tells how to learn what ails a man from observation of the hour when his ailment began, and how to judge of its outcome from the same hour or the hour of the interrogation. Chapter twenty treats of the causes of crises and the terms of days to be observed in the making of prognostications by medical men regarding patients. The succeeding four chapters deal with election of the time of day and the laudable hour in every act in general, in each particular medical operation whether in physic or in surgery, for the cure of each member of the human body, and for blood-letting and the administration of drugs respectively. Chapter twenty-five discusses the defects of the moon and its unlucky places of which one should beware in beginning any action. The next two chapters are concerned with the significance of lunar and solar eclipses, and the twenty-eighth and last chapter is about the revolution of the year and the significance of a conjunction of the heavy planets.

From this synopsis it becomes evident that the bits concerning geography and geology which Duhem extracted from Leonard's work form but a very small and incidental part of it compared to the astrological medicine which constitutes its main body, but the admixture is the usual one then of science and occult science varying in ratio with the subject of a work. Amusing is the deft and rapid, not to say cavalier, fashion in which Leonard disposes of the verse of the Bible which was often quoted against

astrology: "It is not for you to know the times or the seasons, which the Father hath put in his own power," (*Acts*, I, 7). His interpretation is that this does not forbid us to know all future times or moments, but only such of them as the Father has placed in His own power. "Therefore we are free to inquire concerning those which He put in the power of the planets."[40] Surely this is separating the domains of religion and of science —or occult science—with the same clean-cut incisiveness that Alexander severed the Gordian knot. We have already heard the same argument from Angelo Cato in his treatise on the comet of 1472.

For the year 1476 a prediction has come down to us by John of Glogau in Silesia who was professor of philosophy and mathematics at the university of Cracow, where Copernicus attended his lectures on geography in the summer of 1493.[41] The prognostication is preserved in a manuscript at Munich, while his predictions for several later years—1479, 1480, 1481, 1499—are found in printed editions.[42] A treatise on finger computation by him was printed at Cracow in 1511.[43] Manuscripts at the university of Cracow contain other works by him: an interpretation in 1493 of the almanach concerning various influences of the stars,[44] and a work on the extraction of roots dated at the university of Vienna in 1497.[45] In another collection of manuscripts there is a treatise on physiognomy by him.[45a] John of Glogau was also author of a commentary on the *Sphere* of Sacro-

[40] BN 10264, fol. 80v.

[41] Ludwig A. Birkenmajer, *Stromata Copernicana* (in Polish), Cracow, 1924: cited by W. J. Rose, *Isis*, XVI (1931), 137.

[42] CLM 647, fols. 211r-43v: Hellmann (1917), p. 214, lists the editions.

[43] Johannes Glogovienses, *Computus chirometralis*, Denuo revisum et impressum expensis domini Johannis Haller Civis Cracoviensis Anno salutis nostre Millesimo quingentesimo undecimo primo die Augusti.

[44] Univ. of Cracow 1839 (BB.XXIII.14), paper, 15-16th century, fols. 280-284: "Interpretatio eorum que Almanach verorum motuum planetarum inscribuntur de variis que stellarum influxibus . . . per magistrum Iohannem de Glogovia ad laudem dei et universitatis nostre Cracoviensis gloriam et famam feliciter collecta. . . . a.d. 1493 currente."

[45] Univ. of Cracow 1840 (BB. XXIII. 16), paper, 15th-16th century, fol. 138.

[45a] Ossolinski à Leopol 795, 1505 A.D., fols. 71-83v. Zinner 3471-3496, 6081-6086 lists MSS of various works by John of Glogau.

bosco which was printed in 1506 and is interesting for its allusion to the Portuguese voyages and the discovery of a new world.[46] John seems not to have died until 1507.

The first few leaves of the portion of the manuscript which is occupied by John's prediction for the year 1476 are in part blank. One page bears simply the title, *Iudicium anni 1476*. The next contains little more than the statement that Germany is under the rule of Mars and Aries; Bohemia under that of Mars, Mercury, and the last *facies* of Aries; Hungary under Jupiter; the Saracens ruled by Venus; the Turks by Leo and Mars. On the third page is the lone statement that since the conjunctions and oppositions of the moon are computed in the *Almanach* of Regiomontanus, our author has not thought it necessary to give them. The following page is left blank, and on the fifth page we read:

> Jesus. Accidents of the stars for the current year 1476, to the honor of God and fame of the celebrated university of the most famous city of Cracow and the common utility of men by master John of Glogau.[47]

On the sixth page begins the text proper with the first of twenty-four *Differentiae* into which the prediction is divided.[48] These deal successively with the revolution and lord of the year, its general character, especially the weather, the four seasons, the state of Judaism, Christianity, and Islam, fertility and crops, peace and wars, mortality and pest, pope and spiritual matters, emperor, kings, princes and nobles, Poland, Bohemia, and Hungary, the city of Cracow, mercenary soldiers, religious orders, women, the intellectual and official classes, merchants, metals

[46] Johannes Glogoviensis, *Introductorium compendiosum in tractatum Spere materialis magistri Joannis de Sacrobusto . . . in communem studentium utilitatem in stellarum et astronomie studio proficere cupientium cito ac facili verborum stilo anno salvatoris Cristi Jesu millesimo quingentesimosexto currente in universitate Cracoviensi feliciter recollectum* (Cracow, Joh. Haller, 28 April, 1506), 72 fols.

[47] CLM 647, fol. 23r, "Iesus. Accidentia stellarum anno domini 1476 currente pro honore dei famaque incliti studii famosissime urbis Cracoviensis et communi hominum utilitate per M. Io. de Glogovia." The similarity in phraseology to the title of the printed work above will be noted.

[48] CLM 647, fol. 23v, "Diff. 1 de magnarum configurationum celi revolucione et suppositione."

and prices, intercourse by land and sea, and finally with the common people who will have a hard time of it, with many exactions, diseases, and deaths. There then follows in twelve more *Differentiae* John of Glogau's *Judgment* for a lunar eclipse on March 10, 1476, at twenty-four minutes past seven.[49] John of Glogau was not the first master to compose such annual predictions at the university of Cracow, where is preserved a discussion of "Contingent events and accidents from the stars in the current year, 1467," by a master John Stercze of that university.[50]

Next in the same Munich manuscript comes an astrological prediction for 1477 by a Nicholas of Poland at Bologna dedicated to his most gracious lord, James, archbishop of Gnesen in Posen and primate of Poland.[51] Yet other such predictions by other persons continue in the same manuscript and also occupy the next codex in order, CLM 648. The authors, except "Aurelii C." on the year 1478 and Mathias Fibulator de Hertzogaurach on 1480, are men of whom we have spoken or shall speak further. There are predictions by Johannes Laet for the three years 1477-1479, by "Jeorii" (George?) de Russia for 1478, by Girolamo Manfredi for 1478 and 1481, by Battista Piasio for 1478, by Marcus Scribanarius for 1479 and 1480, by Paul of Middelburg for 1480, by Julian de Blanchis and Wenceslaus Faber of Budweis for 1481, and by John of Glogau himself for 1480.[52]

John of Glogau was also the author of a work on nativities[53]

[49] CLM 647, fols. 44r-50r.

[50] Univ. of Cracow, 1839 (BB.XXIII.14), fols. 306-322, "Contingentia et accidentia ex stellis anno domini 1467 currente nutu dei ventura pro laude et honore dei ac totius celestis ierarchie fama ac incremento nominatissimi studii Cracoviensis per magistrum Ioannem Stercze comportata."

[51] CLM 647, fols. 51r-71v, "Stellarum fata M CCCC LXXVII. Reverendissimo in christo patri ac domino domino Iacobo archiepiscopo Gnesnensi primatique Polonie domino suo gratiosissimo. Eiusdem reverendissime paternitatis Nicolaus astrologus Iudicia anni que ex astris excutere potuit ex Bononia feliciter mittit."

[52] Vatican Barberini 343, from which in previous chapters we have noted some earlier predictions, at fols. 2-12 contains an anonymous discussion of nativities for the current year 1456 (or perhaps 1486, the figure being illegible).

[53] Vienna 5216, 15th century, quarto, fols. 11r-44v, Iohannis de Glogavia Astrologie apotelesmata seu doctrina de nativitatibus.

and of a longer *Summa astrologiae*.[54] The *Summa* is a clumsy compilation from such authors as Ptolemy and Hermes, Albumasar and Haly, Abraham Avenezra, Guido Bonatti, and cardinal d'Ailly. John of Saxony is also not forgotten.[55] It begins by distinguishing astronomy and astrology, explaining why the church fathers were so opposed to the latter, and that it does not really conflict with freedom of the will. The bulk of the work is devoted to revolutions of the year, conjunctions, and nativities. Its prime object is to instruct one how to make specific predictions either for a given period of time or for a given individual. In considering such a question as whether "in the geniture of our Saviour and the nativity of his mother" the stars exerted any influence, John gives the utterances of Henry of Hesse (Hendricus de Hassia) to the contrary as well as the more favoring attitude of Pierre d'Ailly.[56] That John was a devout Christian as well as an astrologer is attested by hexameters which he composed in honor of the Virgin.[57]

Alchemy receives some attention in a chapter on the influence of the planets on metals and minerals.[58] John of Glogau assures us that it is the opinion of all alchemists that sulphur and quicksilver are the matter from which all minerals are formed. But his discussion here seems indebted largely to Guido Bonatti, from whom he derives such assertions as that in a year when Saturn is powerful and fortunate, lead mines will thrive, those who work them will rejoice (*eiusque laboratores gaudium habebunt*), and the price will go up—which seems hard to reconcile with the accompanying assurance that lead will be found in abundance in that year.

John of Glogau embodies in his *Summa*[59] a letter to count

[54] It is preserved in a manuscript of the Bibliothèque Nationale, Paris, BN 7443C, which is poorly and incoherently written and is full of omissions, elisions, and misspellings. A part of the work is found in Vienna 5490, 15th century, quarto, 57 fols., Ioh. de Glogavia, Tertia pars summae scientiam prognosticationum stellarum continentis. Possibly Vienna 5216, 15th century, quarto, fols. 1r-44v, Ioh. de Glogovia, Astrologia apotelesmatica seu doctrina de nativitatibus, is also part of it.

[55] BN 7443C, fol. 126r.

[56] BN 7443C, fol. 56r.

[57] Vienna 5191, 15th century, fol. 89r-v.

[58] BN 7443C, fol. 89r-v.

[59] BN 7443C, fols. 126v-132v.

John of Rozgan written in 1468 concerning the nativity of his son, and alludes elsewhere to the great comet of 1472. He further speaks of a verification of the positions of fifteen stars of the first magnitude made in 1473 by that venerable man, master Peter of Casselwien,[60] doctor of medicine and lecturer ordinary in the same faculty, "whose memory be in peace and soul in life eternal."[61] His work must therefore have appeared after those dates and perhaps some years later judging from the words last quoted. It is followed by another discussion of nativities[62] by some Hungarian whose name I could not make out[63] and by a treatise in six chapters on basing judgments upon eclipses by Georgius Medicus de Russia or Russis.[64] Both these treatises are dated at their close in 1490.

An astrological prediction for the year 1479 occurs in a manuscript of the Laurentian Library at Florence in the respectable company of a purely astronomical treatise[65] by Raggius of Florence dedicated to cardinal Giovanni de' Medici, the future Leo X. Raggius is described by Bandini as an arithmetician as well as astronomer. In 1512 he wrote *De siderum cursu,* also *de proportione, de intellectu diviso atque composito*. In 1514 he wrote to Leo X on the question of reform of the calendar. He also undertook to refute certain arguments of the Calculator.[66]

[60] I am uncertain as to the spelling of this name in the MS, where it looks more like Cassolroiem.

[61] BN 7443C, fol. 96v.

[62] BN 7443C, fols. 260-309.

[63] Possibly Maerninus de Illensis.

[64] BN 7443C, fols. 309r-333r. Horoscopes of Frederick, Maximilian, and Ladislas of Bohemia follow at fol. 333v. Hellmann (1917), p. 213, lists a prediction for 1483, printed at Rome, by Georgius Drohobicz de Russia. F. Gabotto, *Nuove ricerche e documenti sull' astrologia alla corte degli Estensi e degli Sforza,* Turin, 1891, p. 28, speaks of a Giorgio di Russia who was astrologer to the marquis of Montferrat. Of the prediction of Melletus de Russis of Forlì for 1405 we have treated in an earlier chapter.

[65] FL Plut. 30, cod. 22, 16th century, 47 fols.: 1r-20, "Raggius Florentinus reverendissimo domino suo domino Iohanni de Medicis tituli sanctae Mariae in Domnica diacono cardinali S.P.D. Cum inter coetera bonarum artium studia . . ."; fols. 21r-47, "Sit notum unicuique intelligenti qualiter ego Iacobus physicus et astrologus Yspanus rogatus a nonnullis ut componerem iudicium de anno 1479. . . ." See Bandini's catalogue for fuller descriptions.

[66] Rome, Casanatense 1431 (B.VI.7), membrane, about 1520 A.D., Raggius Florentinus de proportione propinquitate et remotione confutationes argumentorum Calculatoris.

The author of the prediction for 1479 is, however, a James of Spain, described as both a physician and astrologer. Before commencing his prediction proper, he first briefly presents some arguments for the truth of astrology and cites Aristotle and Ptolemy in its favor. He makes some criticisms of his fellow astronomers and astrologers, stating that one erred in taking an enthronement to apply to the pope, whereas that condition applies only to kings, and explaining the mistakes of others by the fact that they were asleep in bed when the comet was first seen.[67]

Another prediction for 1479 which has come down to us is addressed apparently to the doge of Venice by Matthew Meroti or Moreti, a doctor of Brescia.[68] The work opens by referring to the conjunction which signified the deluge 3381 years before the Saviour's birth, to that of Saturn and Jupiter in 1365 A.D. and the recent one of 1464, and to those of Saturn and Mars of August 30, 1477, in the tenth degree of Cancer and on the approaching first of November, 1479, in Virgo. It next turns to eclipses but then, after predicting as to war and the state of princes, breaks off while discussing the fertility of the coming year.

Yet another prediction for 1479 is that of Aquilinius of Aquila to count Hieronimo, despot of Imola, whom he warns to beware of traitors, since many envy his state. He also predicts a great pest in all Italy for the beginning of March.[69]

Astrological revolutions for the years 1475 to 1480 appear anonymously in a manuscript at Munich and are summary in character, only a single paragraph being devoted to each year.[70]

[67] FL Plut. 30, cod. 22, fols. 24r and 45v.

[68] It is contained in the MS portion of BU AV.KK.VIII.29, fols. 141r-143v, where it breaks off, apparently unfinished, after two lines of text under the caption, "De fertilitate anni." The titulus is, "Pronosticum Mathey meroti (moreti?) Brixie doctoris de dispositione anni 1479 ad serenissimum Venet. principem ac dominum D. Ioannem E$^{\text{crum}}$ dominum suum observantissimum." The text opens, "Nunc sumus in orbe 14 ab coniunctione magna que significavit diluvium. . . ."

[69] *Ibid.*, fols. 144r-145v: "Iudicium anni 1479 per magistrum Aquilinium de Aquila ad illustrissimum dominum comitem Hieronimum dominum Imole. Hoc anno in principio martii pestis erit maxima in tota Italia. . . ."

[70] CLM 24940, 15th century, fols. 166r-167r.

For the decade 1481 to 1491 we have predictions by Julianus de Blanchis, whose name would suggest a Portuguese origin but who calls himself a citizen of Rome and canon of the church of Santa Maria in Trastevere, which were printed at Rome and Passau and apply to the years 1481 to 1483 inclusive,[71] and those of Bonincontri, mentioned in another chapter, for 1485, 1486, 1488, 1489, and 1491, all printed at Rome.[72] John Barbus, apostolic protonotary and a patrician of Venice, published a brief Judgment for the year 1483 at Padua; John Baptista Strimerius of Parma printed in that city a *Tacuinus* for the year 1485; James of Speyer—presumably the same who had corresponded with Regiomontanus in 1465—published a judgment for 1485 at Rome; so did Paul of Poland; and Carolus Susena of Ferrara issued a prognostication for 1486 at Bologna and others for 1491 and 1492 at Modena.[73] Marcus Gualterius of Novellara had addressed his prediction for 1484 to George of Gonzaga.[74] Martin Polich of Mellerstadt, who taught at the universities of Leipzig and Wittenberg and in 1482 became physician to Frederick the Wise of Saxony, besides medical works and commentaries on logic and physics in Thomist vein, engaged in disputations concerning the cabala and published prognostications for the years 1483, 1484, 1486, 1487, 1488, 1489, and 1490. That for 1489 was at the command of the emperor, Frederick III.[75] Later, in 1502, he drew up a prediction for the new university at Wittenberg. John Canter of Friesland, who styled himself an "imperial astrologer," made annual predictions for 1488, 1489, and 1491.[76] John Engel or Angelus predicted for the years 1487, 1488, and later for 1496 and 1497.[77]

[71] GW 4411-4415. Hellmann (1917), pp. 206-207, 211-212.

[72] GW 4907-4912.

[73] GW 3389; Reichling 1399, 1635, 1767, 1834; Hellmann (1917), p. 219.

[74] Accurti 71.

[75] Hellmann (1917), p. 218. For further account of their contents see G. Bauch, *Geschichte des Leipziger Frühhumanismus mit besonderer Rücksicht auf die Streitigkeiten zwischen Konrad Wimpina und Martin Mellerstadt, XXII Beiheft zum Centralblatt für Bibliothekswesen,* 1899, pp. 8-9. I have seen that for 1488 (Hain *11055), addressed to the elector and entitled *Practica lipcensis*. Some of them are in German.

[76] Hellmann (1917), p. 212. That for 1489 was printed at Rome, the other two at Venice.

[77] *Ibid.*, p. 213.

Certain "astrological experiments" are dated 1487 in a manuscript at Munich. They are really weather signs from both the stars and animals. Thus if in autumn the cows lie on their right sides, the winter will be severe; but if they recline on their left sides, it will be mild.[78] There follows some citation from Albert confirmed by an experience of the writer as to dolphins presaging storms. These passages are preceded by a more elaborate anonymous treatise on weather prediction. The author justifies his work on the ground that previous writers on the subject have been so succinct and cryptic. After what he regards as necessary astrological preliminaries he divides his treatise into six chapters, discussing weather changes in general, by the year, by the month, the day, and the hour. Finally, he treats of the mansions of the moon. He lays great stress upon conjunctions and comets.[79]

As John of Glogau's prediction for 1476 was not the first, so it was not the last annual prediction to emanate from Cracow. Bernard, ordinary lecturer in astrology there, published one for 1489, while Marcus Schinagel, "astrologer of the dear university of Cracow," printed an almanach with prognostications for 1487, and others for 1491 and 1493, of which the latter was dedicated to Albert, king elect of Poland. In it Schinagel states that for many years he has issued no *Prognosticon,* having turned from astrology to humanistic studies,[80] but that the prognostications by others for the past year were so misleading that he has re-entered the field. This makes one wonder if the attribution to him of a prediction for 1491 is not incorrect. That by W. de Craco for 1492 was, like Bernard's, printed at Leipzig, while Ladislaus of Cracow published one for 1494 at Rome. John Vierdung von Hassfurt, master of liberal arts, who had

[78] CLM 25013, fol. 20r.

[79] CLM 25013, fols. 11r-19r: "Tractatus de dispositione aeris secundum diversitatem temporum quo ad esse pluviarum et aliorum similium incipit feliciter. Quia astrorum dominia et imperia de pluviis . . . / . . . nihilominus de hys superius memoratio facta est quanquam sit hic determinatio varia aliquorum ex antiquis."

[80] ". . . ego qui plerisque annis nec prognosticon aliquod ediderim huicque militie tanquam vili toga sumpta pene me abdicaverim idque potissime ut rethorice comodius et archanis Minerve vacarem. . . ."

printed a prediction for 1493 at Leipzig with the title, *Iudicium lipczense,* published at the same place a *Practica cracoviensis* for 1495, calculated for the count palatine, and again a *Practica* for 1497. Indeed, his printed annual predictions reach back to 1487 and forward to 1500. The opening sentence of the prediction for 1493 alludes to the many opponents of astrology; the eighth chapter predicts the quantity and prices of the six metals for the coming year. George Leymbach, a bachelor of the university of Cracow, printed predictions for 1498, 1499, and 1500.[81] Wenceslaus Faber of Budweis was another astrologer from central Europe whose annual predictions were made at the university of Leipzig, first as a bachelor, then as a doctor of medicine, sometimes in German. We have prognostications by him in print from 1482 to 1500. He criticized Mellerstadt's prediction for 1482. Jacobus Randersacker was author of a *Practica cracoviensis* of 1499.[82]

Vitus Geroch, a German astrologer, had printed at Rome a prediction for 1488, addressed to the pope or some other prelate.[83] Czerny identified Joseph Gruenpeck, author of a *Pronosticon* printed at Vienna in 1496, with the secretary, chaplain, and historiographer of Maximilian and astrologer of Charles V, who also wrote medical works. According to Czerny the *Pronosticon* was also composed in 1496, while Gruenpeck was a teacher at Augsburg. It is based, however, on the conjunction of Saturn and Jupiter in 1484. It also treats of a recent eclipse, stating that there has been none like it since that under pope Martin, presumably Martin V (1417-1431).[84] A *Iudicium ingol-*

[81] For Bernard of Cracow, GW 4078; W. de Craco, Hain *5799; Ladislaus of Cracow, Hain *5800; Hassfurt, Hain *8372-8374 and Hellmann (1917), pp. 218-219, also Sudhoff, *Iatromathematiker vornehmlich im 15 und 16 Jahrhundert,* Breslau, 1902, pp. 49-51. For Schinagel or Schynagel, Hain *14538-14530, Copinger 2235; for Leymbach, Hain *10064-10065.

[82] For Faber, Hain *6860-6875; Hellmann (1917), pp. 213-214: for Randersacker, Hain *13693. For Faber's criticism of Mellerstadt, G. Bauch, *Gesch. des Leipziger Frühhumanismus,* 1899, pp. 102-103.

[83] Hain *7620.

[84] Josephus Gruenpeck, *Pronosticon sive (ut alii volunt) iudicium ex coniunctione Saturni et Iovis,* per Ioh. Winterburg, Vienna, 1496, 16 fols. (Hain 8087). I have seen this volume but only for a few moments, so that I was unable to determine the date of the

stadiense by John Stabius, philosopher and mathematician, was printed without mention of place or date but was presumably composed at least in Ingolstadt and would indicate that its university, too, encouraged these annual forecasts.[85] But most of Stabius's publications came after 1500. Christian Molitor of Klagenfurt who taught at Vienna where he died of the pest in 1495 is said by Tannstetter to have won glory by his prognostications and to have written certain opuscula in astronomy or astrology which were highly esteemed by the learned.[85a] He was, of course, a different person from Ulricus Molitor, author of a well known work on witches.[85b]

In 1485 there was printed in Italian at Naples by Francesco del Tuppo with the same types that were later used for the *Apologia* of Pico della Mirandola a *Sumario* "Dela nobilissima arte et scientia de astrologia" by Bernard de Granollachs, a master of arts and medicine of Barcelona. The work gave tables for the conjunctions and oppositions of the moon calculated for the city of Barcelona from 1485 to 1550, and was repeatedly republished with the title of *Lunarium* and with tables from whatever the date of republication happened to be until 1550.[86]

Battista Piasio, or Baptista de Piasiis (1410-1492) was born at Cremona and became a doctor of arts and medicine, after studying grammar, poetry, and eloquence under Jacopo Alieri, logic under Nicholas of Cremona who was an Augustinian and

eclipse which might throw some light on the date when the treatise was actually composed. Until Czerny's article (Albin Czerny, "Der Humanist und Historiograph Kaiser Maximilians I, Joseph Grünpeck," *Archiv für österreichische Geschichte,* LXXIII (1888), 315-364) came to my attention, I had assumed that the work was written earlier than the year of printing.

[85] Hain 14973; Hellmann (1917), p. 219.

[85a] In the preface to Georgius Peurbachius, *Tabulae eclypsium,* Vienna, 1514.

[85b] *De lamiis et phitonicis mulieribus,* Cologne, 1489, and other incunabula editions. Recently reproduced in facsimile and French translation, Paris, 1926.

[86] Concerning the edition of 1485 see Fava e Bresciano, II (1912), 59, 212. I have used a copy of it at the British Museum, now numbered IA.29527. For subsequent editions of 1488 and later see Hain 7861-7867, Copinger 2767-2774, Pellechet 5297-5299, Reichling 924-927, 1745, Accurti 71. A late Spanish edition is that of Seville, 1529 (copy at BM C.63.e.9).

Bernard de Granullachs is already mentioned as a physician in 1454: see *Janus,* VIII (1903), 578-579.

professor of theology, and philosophy under Apollinaris Offroy. He first became a teacher of philosophy, then completed his medical studies and acquired a mastery of mathematics and astronomy by himself. Lionello d'Este, duke of Ferrara, called him to that university as professor of philosophy and astronomy. In 1450 he petitioned for the payment of arrears on his salary. Subsequently Francesco Sforza induced him to come to Milan, and Pius II later brought him to Rome. In his *Apologia* he defended the medieval astronomical writers, Sacrobosco and Gerard of Sabloneta, against the Roman usage which he termed barbarous.[87] He was famous for his prediction of future events in his annual almanacs, although Filelfo in one of his letters jokes at his having erred in the horoscope he drew for Sforza.[88] Piasio's long life from 1410 to 1492 has, however, probably served to keep his memory immune from any of the common jibes against astrologers for having failed to predict their own deaths. Possibly he may have set too early a date for it, but no astrologer ever seems to have been reproached for such a prediction. Of his annual forecasts only two seem to have been printed, one for 1485 at Milan[89] and the other a *Scrutiny of Greater and Lesser Accidents for the Year 1491,* dedicated to Ludovico Sforza. It takes up the weather for the coming year, the prospect for fertile crops, disease and health, wars, the state of the catholic church, and so forth.[90] A nativity of 1491 by him is preserved in manuscript.[90a] A funeral laudation of Piasio appeared the year of his death composed by Nicolaus Lucarus of Cremona.[91]

Girolamo Manfredi[92] took his degree in philosophy and medi-

[87] ". . . contra Imperium Romanum quem barbarum in opere suo appellet." I do not entirely understand the allusion, which I draw, with most of the foregoing facts from P. Liron, *Singularités historiques et littéraires,* 1738, I, 316-318. Liron's main source is a funeral eulogy of Piasio by Niccolò Lucari. Tiraboschi, VII, 592-593, adds little to Liron.

[88] XII, ep. 74, cited by Tiraboschi, *idem.*

[89] Hellmann (1917), p. 218.

[90] See Copinger 4749, Bapt. Piasius, *Scrutinium de accidentibus majoribus et minoribus anni 1491,* sine nota (1490) Goth. 4to. 6 leaves. Not in CFCB.

[90a] BM Arundel 88, fol. 123.

[91] Reichling, Nos. 1795 and 1479.

[92] See Orlandi, *Notizie degli scrittori Bolognesi e dell' opere loro,* 1714, p. 176;

cine in 1455; after that he taught logic at Bologna for two years; his name is found again in the rolls in 1458-1460 as lecturer in philosophy; from 1462 to 1493 it appears continuously. At first he taught philosophy, then medicine, but during the majority of these years his chair was in astronomy with the astrological burden of rendering an annual judgment and *tacuinum*.[93] He translated the *Problems* of Aristotle into Italian with some additions of his own, and also published medical works and an anatomy in the vernacular.[94] In 1472 he was, with Galeotto Marzio, Cola Montano, and Pietro Bono Avogaro, one of the editors of the first edition of the *Geography* of Ptolemy. In 1473 he dedicated his *De homine* to Giovanni Bentivoglio, despot of Bologna; in 1478 he composed a plague tractate in Italian. Printed editions of annual predictions by him are extant for many of the years from 1475 to 1496.[95] His *Centiloquium de medicis et infirmis,* first printed at Bologna in 1489[96] and later at Venice in 1500 and Nürnberg in 1530, consists entirely, as we might guess from the first word of the title, of astrological medicine. Its first aphorism avers that, although medicine of itself is a perfect science, yet the physician cannot be perfect in his work without astronomy.[97] Manfredi had the reputation of having never erred in his predictions, and grew rich from his

Giov. Fantuzzi, *Scrittori bolognesi,* 1781-1794, V, 196; Tiraboschi VII (1824), 582-583; Gabotto (1889), p. 402.

[93] In 1469-1471 he taught "astronomy" as well as medicine. After reverting to medicine alone for a few years, in 1474-1475 he changed to "astronomy" with the added duty after 1476-1477 of "faciat iudicium et tacuinum." In 1482-1483 he again gave courses both in medicine and in astrology; in 1483-1485 taught medicine alone; and during 1486-1493 reverted to his chair of astronomy and astrology. See Dallari, I, 43-150. He appears to have died in 1493.

[94] Concerning it see Chas. Singer, *Studies in the History and Method of Science,* I (1917), 97-164. It was printed in 1490.

[95] Hellmann (1917), p. 216, lists a number from 1477 to 1496, while Accurti (1930), Nos. 100-101, notes those for 1475 and 1476. Almost all were printed at Bologna.

[96] I have used BM IA.28849. A MS is Vienna 5503, fols. 178r-187v, "praevia ad Ioh. Bentivogli epistola," but it appears to have been written in 1506, after the work had been printed. Another MS at the university of Cracow, 545 (DD.iii.27), fols. 309-319, is dated at the close 1496 on the day of St. Thomas Aquinas.

[97] Sudhoff, *Iatromathematiker,* 1902, p. 30, gives some further account of the work's content.

astrological practice, but Pico della Mirandola, writing soon after his death, found some grains of comfort in the fact that he had failed to foresee either his wife's death or his own.[98] To have done so would perhaps have contributed more to his knowledge than to his happiness. And it will be recollected that a favorite derogatory remark of religious writers concerning profane science is that it may increase human knowledge but does not make men happier.

Girolamo is not to be confused with Bartolomeo Manfredi who was a favorite astrologer of Ludovico Gonzaga and constructed a clock in the tower of the chief square of Mantua.[99] Simon de Phares almost certainly has Girolamo in mind, however, when he speaks of "Manfredis at Bologna" as for forty years the flower and paragon of astrologers in Italy, salaried by several cities and princes of Italy, and for thirty-five years making annual predictions.[100] Still another Manfredi of Bologna, however, appears to have been Scipio whose defense against detractors of his prognostication was printed at Bologna in 1494.[101]

A judgment for 1491 was made in Italian by Baldinus de Baldinis of Bologna.[102] In his second chapter he affirms that the effects of the solar eclipse of 1487 will last until 1495 and he therefore details them for the year 1491.

The question whether the sky is animated was discussed on November 8, 1491, by Nicoletus Teatinus, whom the writer of the manuscript containing the same describes as "my preceptor at Padua."[103] Teatinus taught at Padua from 1466 to his death in 1499. After 1471 he was excused from making an annual

[98] Pico della Mirandola, *In astrologiam,* II, 9. Bellantius questioned the statement: *Contra Picum,* liber II.

[99] See Soldati, *La poesia astrologica nel quattrocento,* 1906, p. 108; and F. Gabotto, "Bartolomeo Manfredi e l'astrologia alla corte di Mantova," *La letteratura,* Torino, 1891.

[100] *Recueil* (1929), p. 268.

[101] Hain 10698.

[102] GW 3206: in BU AV.KK.VIII.29 it is the eighth tract occupying fols. 39r-42v.

[103] S. Marco VI, 149 (Valentinelli, XI, 23), 15th century, fols. 83v-84v: "Questio excellentissimi Nicoletti Teatini preceptoris mei Padue publice ordinariam philosophie legentis. Questio est an celum sit animatum. Ista questio difficilis est multum propter diversitatem principum peripateticorum in ea. . . ."

astrological judgment. He recognizes that the question which he discusses is a very difficult one because of the diversity of opinion concerning it among the leading Peripatetics. We have heard it discussed by Conrad Wimpina.

Of a prediction for 1491 by Christopher of Glatz in Silesia there is both a German[104] and Latin edition,[105] although only a single copy of the latter seems to exist at Vienna. His *Practica Viennensis,* of which there are three incunabula editions in German in 1492 and 1496,[106] was a similar work, making predictions as to war and peace, sickness and death, the crops, various classes in society, Christians, Jews, and Turks, pope, kings, Venice, Nürnberg, and Cologne. For 1492 there is a *Practica astronomica* by Wenzelay[107]—probably Faber of Budweis.

The *Pronosticon* for 1493 of Bernard or Bernardinus de Luntis, a doctor of arts and medicine of Foligno, was printed at Rome and addressed to Alexander VI.[108] Bernardino had addressed one for the previous year to Innocent VIII.[109] A work on chiromancy in three books by Antiochus Tibertus who is called "astrologus" was written at Bologna late in October, 1494, and printed there in November.[110] But no annual predictions by him seem to have been printed.

Iohannes Basilius Augustonus was a professor of medicine at Padua and received the honorary title of poet laureate from the emperor, Frederick III. There are in print annual predictions by him for the years 1491 to 1496 inclusive, and one on the comet of 1500.[111] That for 1491 was addressed to Frederick III, that for 1492 to Ascanio Sforza, that for 1493 to an apostolic protonotary and abbot at Vercelli, that for 1496 to Charles VIII of France, that for 1495, which was printed in both Latin

[104] *Die wirckung der himlischen einfluss des iars 1491,* Nürnberg, Peter Wagner, about 1490.

[105] W. L. Schreiber, *Manuel de l'amateur de la gravure sur bois et sur metal,* Berlin, 1891-1911, 8 vols. in 9, No. 3718.

[106] Schreiber Nos. 3719-3721; Hain *7786.

[107] CFCB, p. 223.

[108] Accurti (1930), No. 93: opening, "Cum mecum ipse sepenumero cogitarem . . ."

[109] Hain *10336.

[110] Hain *15519.

[111] GW, Nos. 3068-3075.

and Italian editions, to the people, and that for 1494 apparently to no one in particular. That for 1493 was accompanied by an oration in praise of medicine; that for 1496 is bound with a medical disputation held at Turin with celebrated physicians; and that on the comet of 1500 is accompanied by a treatise on the remedy for a certain disease popularly known as Gorra. Moreover, of the six chapters of the work on the comet the last three are concerned with the cure of elephantiasis, a defense of Cornelius Celsus, the Roman medical writer, and a discussion of the nature of hellebore.

For the years 1492 and 1494 predictions are extant in print by Augustinus Moravus (Augustine of Moravia?) directed respectively to Ladislas, king of Hungary and Bohemia, and to Bohuslav, bishop designate of Olmütz. Augustinus, whose family name was Käsenbrot or Käsebrod, was provost of the cathedral at Olmütz and studied at Padua. He died in 1513. Both prognostications were composed at Padua, on November 13, 1491, and January 1, 1494, respectively, but were printed, the one at Rome, the other at Venice.[112] The latter is in fourteen chapters on great conjunctions, lords of the year, eclipse of sun and moon, weather, wars, pest and other diseases, crops, Alexander VI, Maximilian, the king of Hungary and Bohemia, Venice, and jovial, mercurial, and venereal persons. At the close, addressing Antonius Laurus of Padua, Augustine states that he had decided to abandon astrology for gentler muses and pass on the load of prediction to a youth whom he had trained, Nicolaus Basileus Tergestinus, but that Laurus had persuaded him to edit this one.

Pietro Buono Avogaro, or Petrus Bonus Advogarius,[113] whom

[112] For the editions see GW 3059 and 3060. Neither appears in CFCB. I have seen that for 1494 in a collection at the university of Bologna library numbered AV. KK. VIII.29. Its incipit, not quoted in GW 3060, is, "Miraberis scio reverendissime presul. . . ."

[113] The best account of Avogaro seems to be that given by Boncompagni in a long bibliographical note occupying most of pp. 339-342 in his "Catalogo de' lavori di Andalò di Negro," *Bullettino di Bibliografia e di storia delle scienze matematiche e fisiche,* VII (1874).

we mentioned a while ago as one of the editors of the *Geography* of Ptolemy in 1472, had already in 1466, together with Giovanni Bianchini, been charged by duke Borso of Ferrara with the task of examining a manuscript of that work.[114] In other manuscripts of Ptolemy's *Geography* in the Latin translation of Jacobus Angelus is an introductory letter from Nicolaus Donis, a German Benedictine of Reichenbach, to Borso in which Bianchini is named as the leading mathematician of Ferrara, Avogaro as its first physical scientist, Sonzinus in medicine, friar Francis in dialectic and philosophy, Franciscus Procellinus in both laws, John Gattus in theology and the classics, and Jerome Castellanus in every branch of learning.[115] Avogaro was a doctor of arts and medicine who taught astrology at the university of Ferrara, according to some authorities from 1455 to 1473,[116] according to others from 1467 to 1506.[117] At least he wrote an astrological work as early as 1456,[118] which appears to have closed with allusion to the comet of that year.[119] He sometimes appealed to the duke for financial assistance and in a petition of 1468 alludes to the recent deaths of his father and one of his sons from the plague. These bereavements and the pest had prevented his going to Rovigo to lecture but had not kept him from making

[114] *Ibid.*, p. 341.

[115] A. M. Bandini, *Cat. cod. lat. Bibl. Laurentianae,* Florentiae, 1774-1777, II (1775), 69, quotes the Latin text of the passage from FL Plut. 30, cod. 3. Boncompagni lists another Este MS, VI.H.7. Yet another Este MS of the *Geography* bears the name of Avogaro himself as its former owner.

[116] C. Foucard, *Monumenti storici spettanti alla medicina, chirurgia, farmaceutica conservati nell'Archivio di Stato in Modena,* 1885, p. 27; cited by Giulio Bertoni, *Guarino da Verona fra letterati e cortigiani a Ferrara (1429-1460),* 1921, p. 94.

[117] Borsetti, *Historia almae Ferrariae gymnasii,* II (1735), 47-48.

[118] Florence, Bibl. nazionale, classe XI, cod. 121 (formerly Strozziano 1127), fol. 243r, "Die Iunii 1456 Petrus Bonus Avogarus." The text opens: "Stelle cum caudis secundum Ptolomeum in libro centum verborum novem sunt. . . ." I follow Boncompagni's description of the manuscript. The text is now missing, as is a work by Toscanelli on the comet of 1456 which is listed in a table of contents on the fly leaf as formerly found at fol. 237. But see our chapter 57, notes 67-75.

[119] *Idem:* ". . . Morientur taurini et civitates taurine ab epidimia non evadent ex cometa cum tauro ascendente. Civitates autem et provincie taurine sunt Campania magna Bononia Siena Verona Ancona Tarvisium, secundum aliquos Mantua Asti Senegalia Pensaurum."

an annual astrological prediction. The comet of 1472 elicited a treatise on comets from him.[120]

Avogaro emended the treatise of Andalò di Negro on the astrolabe in the edition of 1475. On the last day of February of the same year he finished at Ferrara a brief astrological work consisting of a table of things to do or not to do according as the moon is in each sign of the zodiac and a page of cities arranged under their governing signs and planets. This is preserved in a Latin manuscript of the Vatican;[121] in another is what appears to be a lunar *Computus.*[122] After 1475 compositions of Pietro Bono Avogaro continued to pour from the printing press in the form of annual astrological predictions. According to his contemporary, Simon de Phares, he lived to be the physician and astrologer of pope Alexander VI, to predict the coming of Charles VIII to Rome, and to make with Bonatus (or, Bonetus) de Latis, a Jew of Provence, predictions which were printed for "this current year," presumably 1498.[123]

Bonetus de Latis also was astrologer to Alexander VI, according to Simon, and there is extant in print an *Annulus astronomicus*[124] which he wrote for that pope. It describes a ring to be worn on the finger which is marked with the signs of the zodiac, degrees, and twelve months, and with which one may find the position and altitude of the sun, the sign and degree that is in the ascendent, the hour of day or night, the altitude of the stars, the positions of the planets, whether a planet is direct or retrograde, the latitude of cities and the height of towers. In other words this ring is an astrolabe in miniature. Bonetus furthermore addressed a prediction for 1493 to Alexander VI, one for 1496 in Italian to Caesar Borgia, then a cardinal, and one for

[120] It was formerly found in a MS of the Saibauti collection at Verona which is now dispersed.

[121] Vatic. 5373, fol. 4, "Actum ferrarie die ultimo feb. anno a natali christiano 1475 per me petrum bonum aduogharium artium et medicine doctorem." I have examined this MS.

[122] Vatic. 6253, Magistri Boni liber computi de luna, opening, "Compotus est . . ."—a good illustration of the varying spelling of that word. This MS I have not seen.

[123] *Recueil* (1929), p. 269.

[124] Described by Fossi in his account of the incunabula in the Magliabechian library at Florence.

1498 to Caesar and his brother Giovanni, both cardinals. Yet another prediction by Bonetus for 1499 was also printed at Rome.[125]

Avogaro's relation to Alexander VI seems more dubious, since all his annual predictions from 1477, when they first began to appear in printed form, to 1501, by which time Simon de Phares's work had been completed—although of course Alexander VI lived on to 1503—are addressed to duke Ercole d'Este. These annual predictions were printed sometimes in Latin, sometimes in Italian, sometimes in both languages.[126] I have seen one for 1477, "published in vernacular verses by Antonio Cornazano," but dated at the university of Ferrara on February 27, 1477, another for 1494 in Latin, and others for 1497 and 1498 in Italian prose. The work of Albertus Magnus, *De causis proprietatum elementorum,* is cited in opening the one in Latin and soon after opening that in Italian verse. Aquinas is cited in favor of astrology in one of the works in Italian prose. There are no predictions by Avogaro between 1477 and 1487 or for 1489 and 1490 extant, whether it be that Pietro failed to compose any for these years, or that they were not printed, or that no record of the editions has survived. The prediction for 1477 appeared at Ferrara in Italian on February 27. The predictions for 1487 and 1488 were printed at Venice; those for the years 1491-1501 appeared variously at Ferrara, Florence, Bologna, Rome, Venice, and Milan. The fairly frequent instances of printing at Rome from 1493 on are perhaps an indication that Avogaro was there in attendance upon Alexander VI but continued as before to address his predictions to Ercole. For the year 1506 we have astrological predictions by Pietro's son, Agostino, who thus followed in his father's footsteps.[127] Avogaro was not the only astrologer to write predictions for Ercole, to whom Hieronymo

[125] GW 4842-4845; Hain *9927; I have examined the prediction for 1496 in BU AV.KK.VIII.29, fols. 65r-68r.

[126] See GW 232-259 for these various incunabula editions.

[127] Boncompagni, *Bullettino,* VII (1874), 341-342.

Catinello, doctor of arts and medicine, addressed prognostications for 1497 and 1500 in Italian.[128]

To king Matthias of Hungary was addressed the famous *Prognosticon de eversione Europae* of Antonio Torquato or Arcoato (Arquatus or Torquatus), physician and astrologer of Ferrara. This prediction of events from 1480 to 1540 was printed at Antwerp in 1522 and a number of times thereafter. The British Museum has editions of 1536, 1544, 1552, etc. Marquard Freher (1565-1614) included it in his collection of German historical documents.[129] It is a suspicious circumstance that there is no incunabulum of this work, whereas there are incunabula in both Latin and Italian for annual predictions by Arquatus for the years 1491 to 1495.[130] Of these the first two for 1491 and 1492 were addressed to Alfonso of Aragon, duke of Calabria, while the prediction for 1494 was addressed to Ferdinand of Aragon, king of Spain. Perhaps, however, if the *De eversione Europae* was written in Hungary and addressed to Matthias Corvinus, it may have escaped immediate publication on this account. After Matthias's death in 1490, Arquato would, like other humanists at the Hungarian court, have returned to Italy and entered the service of the house of Aragon, to members of which his published predictions for 1491, 1492 and 1494 were addressed. I have seen that for 1492 which is in Latin and

[128] BU AV.KK.VIII.29, fols. 69r-72v: "A lo illustrissimo et excellentissimo duca Hercule signore de ferrara modena e rezo principe invictissimo de hieronymo cattinello de la arte e medicina doctore pronostico de lo anno 1497 . . . / . . . Finito lo iudicio a ferrara a di XXV de novembre 1496 per lo egregio doctore de la arte e medicina m. Hieronymo Catinello facto cum gratia." *Ibid.,* fols. 85r-88v: prediction for 1500, "Finito adi.17.de decembre de 1499."

[129] M. Freherus, *Rerum Germanicarum scriptores,* ed. of 1637, ii, 169-175, ed. of 1717, II, 387-394. I have also examined the edition of 1536, and the following MS: Vatic. Barb. 904, 16th century, fol. 229v, "Pronosticum eversionis Europae circa annum 1507 Matthiae Ungariae regis directum circa annum 1480." Another MS is Ferrara Bibl. comunale I, 71, circa 1512 A.D.

I have also examined an edition in Italian (BM 8610.C.9) dated in the catalogue as [1510?] but which seems later than the Latin edition of 1536, since it advances the predicted date for the downfall of the Turks from 1536 or 1537 to 1538 or 1548. Copinger 666 dated it 1500 but GW calls it sixteenth century.

[130] GW 2552-2559.

opens with a display of classical learning by listing the names of various Greek philosophers and their views as to God and fate. Arquato fails to forecast either the discovery of America or the conquest of Granada in 1492.

The popularity of the *De eversione Europae* was probably partly due to the fact that its predictions more nearly coincided with the event than did other similar prognostications contemporary with it which have dropped out of notice, but partly too perhaps to its sensational character, although other astrological pronunciamentos were apt to share this feature. Rohr has contended that the work was really composed in 1527-1528, pointing out that all the true and precise predictions are of events before 1528 and all the vague and erroneous ones for the years following, but Rohr used no edition earlier than 1534[131] and of course in later editions the earlier predictions may have been doctored to conform better to the event, just as a manuscript in the Este library gives marginal notes added after the event. Torquato appears to have predicted the French invasions of Italy at the close of the fifteenth century, the sack of Rome by the imperial troops in 1526-1527, and the control of much of Italy by Spain. But his predictions were also to a large extent erroneous. He promised the fall of the Turks before 1538 and the recovery of Constantinople by a Christian emperor who would rule over both the east and west after the sultan had been killed by a future king of Hungary. And while he predicted all sorts of backslidings and woes for the church, these could scarcely be identified with the Protestant revolt, since he states that they will last only eight years. He further predicted that the most cruel pests and unheard-of diseases would almost entirely consume the five great Italian cities, that there would be tremendous floods and a great prevalence of piracy. But we cannot go over his forecast in detail. A remarkable thing about the

[131] J. Rohr, "Eine Prophezeiung aus dem Zeitalter der Reformation," *Hist.-Polit. Blätter,* 118 (1896), 808-826, 865-881. See also his "Die Prophetie im letzten Jahrh. vor der Reformation," *Historisches Jahrbuch,* XIX (1898), 29-56, 447-466.

printed versions is that, except for mention of the conjunction of 1524 in some editions, Arquato does not reveal the astrological basis for his predictions, but makes them dogmatically without giving any reasons. This is not true, however, of his prediction from 1480 to 1507 as contained in a manuscript of which we shall presently treat, which discrepancy gives further grounds for mistrusting the printed versions.

Borsetti, who described Antonio Torquato or Arquato as a physician and astrologer, thought it probable that he was a professor in the university of Ferrara. Borsetti had seen two manuscripts of the *Prognosticon de eversione Europae* to Matthias, king of Hungary, but it would hardly be possible to find them now from his reference.[132]

The earliest form of *The Overthrow of Europe* that I have encountered is a version preserved, or rather partially preserved, in a Barberini manuscript at the Vatican.[133] Like all other versions, this professes to be a prognostication directed to king Matthias of Hungary about the year 1480. But, unlike the printed versions, our manuscript does not carry its predictions on to some such year as 1538 or 1540 or 1550, but sets the approaching overthrow of Europe in the year 1507 or thereabouts. We thus have to do with a very different work from that described by Rohr. Rohr did not make clear just which edition he used for his résumé of the prediction but he evidently knew of none earlier than that of 1534, and of manuscripts mentioned only one in German. Aside from its general dating of the predicted disasters "about the year of Christ, 1507," but "in some places sooner, in others later, according to the revolution

[132] Borsetti, *Historia almi Ferrariae gymnasii,* 1735, II, 28; "Antonius Torquato Ferrariensis, Medicus ac Astrologus quem in Universitate nostra professum fuisse probabiliter credimus; Scripsit *Prognosticon de Eversione Europae ad Matthiam Ungheriae Regem:* Hoc opus vidimus apud amicissimum Concivem nostrum venerandae cultorem Antiquitatis Joseph Antenorem Scalabrini. In alio Codice Operis praedicti, quem pariter vidimus, Auctor noster non TORQUATO, sed ARQUATO denominatur."

[133] Vatic. Barb. 904, 16th century, fols. 229v-230r. I have not seen Vatic. Urb. 526, end of 16th century, fols. 14-25; and Vatic. Urb. 857, 17th century, fol. 494; but assume that they are later versions.

of the world," our manuscript gives no precise dates for specific future events such as Rohr states abound in the prognostication. It does not predict a sack of Rome for 1527, nor does it forecast with surprising accuracy the happening of the years preceding 1527, while it is vague and uncertain as to those of the decade following. It does not envisage, or attempt prediction for any such remote period. Its attention is confined to a conjunction of the planets and lunar eclipse in 1504 whose influence will be felt especially in 1507 or thereabouts. Here again our manuscript differs from some at least of the printed versions which give no astrological basis at all for their long series of prognostications. There seems no good reason, therefore, for doubting that the prognostication of the Barberini manuscript was made before 1507 and presumably before the conjunction and eclipse of 1504. Whether it was composed as long before this as 1480 is more dubious, although we have seen that Iohannes de Muris addressed to Clement VI, who died in 1352, a prediction of the effects to be expected from the future conjunctions of 1357 and 1365.

Matthias Corvinus, on the principle that fore-warned is forearmed, may have thought it well to acquaint himself with the prospects for 1507 as early as 1480, especially if they were to be of as cataclysmic a character as Torquatus was inclined to conclude. The forecast as recorded in our manuscript opens at any rate with matters which would be of close interest to the king of Hungary. The empire of Constantinople will be dissolved, war will be made upon the Turks who will also quarrel among themselves through all Greece and Asia Minor, which will further be ravaged by the pest, and the empire will fall from the house of the Ottomans. This prophecy, made in our manuscript for around the year 1507, of course was not fulfilled then and in the subsequent printed versions was promised before 1538—a revised forecast which equally failed of realization. Our manuscript proceeds to predict like bloody wars and devastation for Africa. Venice is threatened with cruel pestilence and terrible wars in which its foes will be victorious. Milan and Lucca should

also watch out. A very strong prince with great armies will appear from the north and wreak destruction. Through all Europe pestilence will rage with such mortality and penury that few will survive. Floods will submerge peoples, cities, and regions. Pirates will despoil the maritime cities. There will be wars between France, Germany, England, and Hungary. The Roman church will be saddened, the cardinals and some of the prelates expelled and deprived of their goods, and the pope will become a fugitive. But in time the prelates will recover their prosperity and a new pope will be created who is not an Italian. From the north a great heresiarch will subvert peoples from the apostolic see with the aid of great northern princes. But all this is to occur about 1507, at which time these predictions remained unfulfilled. By the time the Lutheran revolt was well under way they would excite more interest, and it is perhaps on this account that they were first printed in 1522.

In closing our manuscript discloses the fact that it does not present the full text of Torquatus's prognostication in its original form, but only gives an excerpt or digest of portions of it. For it states that many other predictions were contained "in the aforesaid epistle"—presumably, that is, of Torquatus to Matthias Corvinus—regarding oriental wars, the sultan of Persia, and other infidel lords, but that it is not interested in them, or that "they do not concern us."[134]

We may therefore explain Rohr's difficulty as follows. The entire prognostication as found in the editions of 1534 and thereafter was not faked out of whole cloth. Rather we have to do with a series of successive prophecies and amendments which were later fused into a single whole. The earlier predictions were largely inaccurate, as such forecasts are apt to be, but they hit some things right, as was to be expected from annual predictions made only a few months beforehand, when the trend of events was fairly evident, or even from an estimate of what would follow

[134] Vatic. Barb. 904, fol. 230v, ". . . et aliorum dominorum infidelium de quibus nihil ad nos. Amen." These words form the explicit of our prognostication and of the manuscript as a whole.

a conjunction several years hence. Those predictions which came true or seemed to come true were then after the event given their proper exact dates and associated with the actual historical events to which they seemed to refer. This was apparently first done in the margin of old manuscript copies, then incorporated into the text and so printed in the subsequent editions. On the other hand, those predictions which had failed to come true at the time or times originally set were pushed forward into the future, as the loss of Constantinople by the Turks was promised first for 1507 and then by at least 1538. Nor was this exactly faking. So much of the earlier prediction or predictions of Torquatus had seemed to correspond to the subsequent event that his name and prognostications had created a favorable impression, so that it was felt or hoped or dreaded that the rest of his prophecies would or might also eventually come to pass. To strengthen this impression his earlier forecasts which had roughly corresponded to certain events now past were rather disingenuously altered to a much closer correspondence. This may have been done by their copyists, editors, and publishers rather than by Torquatus himself, but he probably would not have hesitated to do the same himself. We have seen in a previous chapter how easy it was for John of Eschenden to convince himself or at least to claim afterward that he had predicted the Black Death of 1348 back in 1345. Our newspapers today, although their prime purpose is news of recent events rather than prediction of events to come, are constantly claiming or boasting to have correctly forecast the outcome of this or that contest or to have divined the policy of so-and-so. We therefore should not be surprised if in the past astrologers whose prime purpose was prognostication should do everything within their power to give the impression that they had predicted truly.

To king Matthias of Hungary was also addressed a judgment for the year 1486 by Eustachius Candidus, a canon regular of Bologna.[135] Its opening passage almost gives the lie to the dating

[135] The work is not listed in Hain but constitutes the second tract in a volume of the university library at Bologna numbered AV.KK.VIII.29. "Eustachii candidi Bononiensis canonici Regularis Iudicium Anni MCCCCLXXXVI Ad Serenissimum ac invictissimum Mathiam Ungarie Bohemieque regem. Consideranti mihi Serenissime ac invictissime rex Neminem fato nescio quo huius nostri temporis astronomorum extitisse qui maiestati tue hactenus sui ingenii monumentum ullum dicaverit. . . ." The tract ends at fol. 4r without a colophon. Copinger 1424 appears to list a different edition: "Romae, per magistrum Eucharium Silber (1486)."

of Arquato's *Overthrow of Europe* in 1480, since Eustachius asserts that no modern astronomer had hitherto dedicated any monument of his genius to Matthias, although the king delights in the study of that science. But inasmuch as Antonius de Camera is said by Simon de Phares to have addressed an annual prediction to Matthias as early as 1466, Eustachius would seem to have been misinformed. The prediction of Eustachius is notable in abandoning the entry of the sun into Aries as the beginning of the year and adopting instead its entry into the orient on the twentieth of April. He predicts that many prelates of the Roman church will be killed by poison, and that seven cardinals will die of fever and one while traveling. The cardinal of Genoa is warned that even before the period covered in this judgment begins he will be in danger of death by poison or steel at the hands of women because of his past irregularities with them. The emperor will be in mortal peril, but the king of Hungary will be victor in war and gain great dominion because of the emperor's death and the conjunction of Jupiter, Saturn, and Mars in the first degree of Capricorn. He should beware, however, of being poisoned on account of a woman now noble but once not so. If a certain prisoner should escape, the king would suffer injury from the *triplicitas* of the sun and Mars and the quadrature of Saturn and Venus about the thirteenth of July and first of August.

A prediction of the closing fifteenth century which rivalled Arquato's *Overthrow of Europe* in widespread and long-continued popularity was the *Prognostication* of John Lichtenberger,[136]

[136] I have examined the work in facsimile reproduction by the Holbein Society, 1890, edited by W. Harry Rylands, of the "first edition" of Strasburg, 1488 (D. Fava, *op. cit.*, 1930, p. 130, however, ascribes the original German edition "indubbiamente" to Heinrich Knoblochter, Heidelberg, 1488), and in the volume shelf-marked 8631.cc.34 at the British Museum: "Explicit haec pronosticatio quae durabit usque ad annum millesimum quin-

which purports to have been "given in a shady lane under an oak tree . . . in the year of the Lord, 1488, the first of April, by a wanderer hiding in the woods whose eyes are dimmed and whose pen trembles with age."[137] This prognostication appears to have been printed more than once in the year of its composition, to have been reissued in Latin in 1492, 1494, and 1499, and in German and Italian translations in 1492.[138] The work continued to be reprinted in the next century, editions appearing at Venice in 1511, Cologne in 1526, and as late as 1547 and 1620. In 1522 John ab Indagine (Johannes von Hagen) looked back on "Ioannes Liechtenberg" as a miracle of nature, a man not inferior to Ptolemy, and by many regarded as a prophet.[139]

gentesimum sexagesimum septimum. Impressum Venetiis die vero xxiii Augusti." Reichling, III (1907), No. 967, suggests the date 1487 for this Venetian edition of August 23, but it was dated "(1520?)" in the British Museum catalogue at the time of my consultation, and Mr. Victor Scholderer of the Department of Printed Books, British Museum, informs me by letter of 22 December, 1931, that "Reichling is evidently in error in supposing the book to belong to the fifteenth century." I have also made some use of the undated edition (1488?) shelfmarked IB.15483 at the British Museum and of the early editions in the Pierpont Morgan library, New York.

A MS which I have utilized is CLM 14668, 15-16th century, fols. 7r-41v: "Pronosticatio in latino rara et prius non audita que exponit et declarat nonnullos celi influxus et inclinationes certarum constellationum magne videlicet coniunctionis et eclipsis (et) que fuerunt istis annis quid boni malive hoc tempore et in futurum huic mundo portendatur (?) et durabit pluribus annis." This wording is identical with the title page of the Strasburg, 1488, facsimile, except that the latter lacks the *et* which I have enclosed in parentheses and reads *portendant durabitque* instead of *portendatur* (?) *et durabit*, but I do not know if this MS possesses independent value or is merely a copy from the printed version. It has the directions for the wood-cuts which appear in the printed editions but not the pictures themselves, and it gives the *Praefatio* and *Oratio autoris* after the prognostication instead of before it, as is the case in the printed version.

[137] In the facsimile edition the colophon reads (fol. 36), "Datum in vico umbroso subtus quercum Carpentuli anno domini M CCCC LXXXVIII Kalendas aprilis per peregrinum Ruth in nemoribus latitantem cuius oculi caligaverunt stilus tremet senio oppressus. Valeant que recto animo emendant valeantque ut valere phas est qui oblatrare non cessant." In CLM 14668, fol. 37v, the reading seemed to be "per peregrinam Putes," rather than "per peregrinum Ruth." What "carpentuli" or "Carpentuli" means I do not know.

[138] For the incunabula editions, Hain *10080-10089. Concerning some thirteen Italian editions see D. Fava, "La fortuna del pronostico di Giovanni Lichtenberger in Italia nel quattrocento e nel cinquecento," *Gutenberg-Jahrbuch* (1930), 126-148.

[139] Johannes ab Indagine, *Introductiones apotelesmaticae . . .*, Strasburg, 1522, fols. 15v-16r.

Who was the author of this prognostication who alludes to himself as "your unworthy servant, John Lichtenberger"?[140] He has been represented as a hermit of Alsace and as an astrologer of Frederick III,[141] for which last we have the later testimony of Spalatin. Liliencron found in a manuscript a popular song of 1475 which alludes to a John Lichtenberger of Mainz.[142] The preface of our prognostication states that the author has been making predictions of all the great evils "in this Remagen (?) and in Swabian parts" for twenty years past.[143] This assertion is largely substantiated by an earlier prediction by him in Strasburg from the conjunction of Saturn and Mars on August 31, 1473, which was printed at Cologne about 1475 but has hitherto been little known to bibliographers, although it once belonged to Robert Browning.[144] In it, moreover, he refers to a still earlier work of his composed at Speyer on September 22, 1468, on the comet which appeared then in the sign of Gemini. The work on the conjunction also supports the association of Lichtenberger's name with that of Frederick III, since it is addressed to the emperor and princes. The discussion of the conjunction of 1473 is continued by an astrological figure for the siege of Neuss by Charles the Bold of Burgundy in 1474 by

John Grunbach, alias Lichtenberger, judge of the stars for the holy empire, composed in Alamania and here depicted in the glorious city of Caesar Augustus (? *cesaria augustensi*) on St. Lawrence's day of

[140] In the "Oratio autoris."

[141] Friedrich (1864), p. 29.

[142] R. von Liliencron, *Die historischen Volkslieder der Deutschen*, Leipzig, 1865, II, 58.

[143] Facsimile of 1488 edition, fol. a iii verso, "Sed quid externa adduco suffragia? Sunt qui sciunt me sigillatim omnia que in hoc Remnagio (?) necnon Alemanie partibus per grandia mala obvenerunt invidentibus nonnullis recte divinatus sum viginti quasi annis iam transactis."

[144] It was formerly in the library of C. Fairfax Murray and is described at some length in the *Catalogue of a Collection of Early German Books in the library of C. Fairfax Murray*, compiled by Hugh Wm. Davies, privately printed, London, 1913, II, 787-788, No. 478, and is now in the Pierpont Morgan library, New York, where I have consulted it. "Coniunctio saturni et martis in anno domini M.cccc.lxxiii penultima die mensis augusti per me iohannem lichtenberg In urbe argentina. Domino imperatori et principibus manu mea propria presentata die octava assumptionis beate Marie virginis et calculata." After this titulus the work opens, "Gloriosissimi Reverendissimi Illustrissimi katholice religionis defensores dignissimi. Eorum qui sunt sub circulo lune. . . ."

the same year presented with his own hands to lord Frederick the third, emperor of the Romans.

Advice to Frederick III then follows, both astrological and in the figurative and high flown style of imperial prophecy. Frederick will be that second Octavian. The little volume then concludes with two letters of 1474, one from the camp before Neuss on November first, the other an insulting warning by Frederick III to Charles the Bold from Frankfort on December third. But to return to the longer prediction of 1488.

The work is made up of a rather long preface in which astrological prediction is justified as not contrary to divine providence, of a prayer by the author somewhat in the style of Julius Firmicus Maternus, of a first part on pope and church in three chapters, a second part on the emperor, empire, and adjoining states in thirty-four chapters, and a third part on the condition of the people or private life in fourteen chapters, followed by paragraphs on the years 1488 and 1489, 1491-1493, 1494-1495, and other similar groupings into the next century. Indeed, the prognostication looks ahead as far as 1567 and so is much more than an annual prediction. It has been regarded as contributing to the uprisings of the peasantry in Germany and to the Protestant revolt, but its original contents, at least, do not substantiate these estimates of its effects. If Remagen was the place of its composition, the author can hardly be regarded as a hermit of Alsace, since it is even farther down the Rhine than is Mainz with which we have also heard his name connected. And it will be recalled that he composed his work on the comet of 1468 at Speyer.

In large measure the work is astrological and resembles the predictions of other learned star-gazers of that period. It is based especially upon the conjunction of Saturn and Jupiter in 1484 on November 25 in Scorpio, that of Mars and Saturn in the same sign on November 30, 1485, and an eclipse of the sun on March 16, 1485. A recent benevolent conjunction of Jupiter and Mars will moderate the evils somewhat. Reference is also made to the conjunctions which announced the deluge and the birth of Christ, and to those of 1365 and 1425. Lichtenberger asserts that before

1365 Saturn and Jupiter were in aerial *triplicitas*, and again in 1385 and 1405, but that in 1365, 1425, and every recurrence of the conjunction to date they were in watery *triplicitas*. Learned works on astrology are cited, such as "Albertus in his Speculum" (i.e. the *Speculum astronomiae*). As to the time which elapses between the eclipse and the events it signifies Lichtenberger finds "varied opinions of authors." For while all try to investigate this by the distance of the eclipse from the ascendent, some measure the distances by hours, others by the number of intervening signs. Moreover, some allow a month for each hour or sign, while others of no less authority like Haly and Ptolemy allow a year for each.[145]

Although he seems to subject the rise of false prophets at least to the planets, Lichtenberger holds that he derogates in no way from free will, and that God's mercy may alter what he predicts. But to those who would limit the astrologers to universal judgments he retorts that universals do not exist except in particulars.

He exempts Innocent VIII from the courses of the stars, affirming that his fate is governed by the judgment of God. But he prays God to deign to confirm this pope's auspicious day of election and fortunate hour of enthronement. The recent eclipse threatens the church with perils, and in 1496 new ills will break out among the cardinals to continue for many years.

A distinguishing feature of Lichtenberger's prognostication is that it is evidently intended for German consumption. Its political predictions are largely for the Holy Roman Empire, its electors, and the adjoining states of central Europe such as Bohemia, Hungary, and the Turkish menace. As Samson was shorn of his locks, so "the head of the German nation" will be weakened by revolts of the people of Ghent, Bruges, Flanders, and Picardy.[146] Instead of dealing with a succession of Italian cities Lichtenberger in his third part includes Hungarians, Bohemians, Bavarians, Alsatians, Swabians, imperial cities, Franconia, the Black Forest, Trier and the Moselle, Hesse, Saxony, and Thuringia

[145] *Pronosticatio*, II, 26 (fol. e i recto in the facsimile edition).

[146] *Pronosticatio*, I, 3 (fol. b iii recto).

"to the north sea." The work none the less enjoyed great popularity in Italy where it was printed repeatedly in both Latin and Italian.

With the astrological prediction is mingled prophecy based on the revelations of Joachim, Saint Bridget, Reinhard the Lollard, the sibyls, and Francis. But the recent conjunction will also give rise to new prophets. One will be born about 1496 who will stir up the people to revolts, found new laws and abrogate old laws and make things very unpleasant for learned jurists.

About nineteen years after the recent conjunction another prophet will see the light, and his preaching will last for another nineteen years. He will be a monk in white who will perform signs and wonders and free men from demons not by force of words but by his mere presence. He will cause much bloodshed and lean to the Chaldean faith. After him another prophet will arise in the land of the lion and preach at the Roman court. Under a cloak of sanctity he will examine and burn many men, having a malign spirit rooted in his heart, and will deceive prelates and princes and make the wisest err, especially in Lombardy and upper Germany. He will be more honored by the people than anyone since the church was founded but in the end he will perish by a shameful death. According to Joachim in the *Book of Concord* a pope of great sanctity will then reign four years and will be followed by three very holy men who will continue the restoration of the church. After Frederick III iniquity and infidelity will abound. Lichtenberger would identify Maximilian rather than Frederick with the king of modest countenance of earlier prophecies. The sultan will seize the islands of the Mediterranean and portions of the Italian peninsula—Apulia, Calabria, Campania, and the Abruzzi. Maximilian will free Europe from the Turkish menace and recover Sancta Sophia, but if the princes of Germany do not cooperate with him, the fifteenth branch of the Ottomans will devastate Poland and central Germany and invade Picardy, Brabant, and Flanders.

Besides astrology and prophecy, Lichtenberger's treatise contains a little of almost everything, a fact which may account for its popularity. Lichtenberger dips into past as well as future, adverting to the early history of the archbishops of Cologne, of Gaul or France, and of the Ottoman Turks. Present political and religious opinion is also freely expressed. Lichtenberger cites animal analogies to justify monarchy in general and the king of the Romans in especial. He scolds the seven electors for their shabby treatment of Maximilian and praises the count Palatine of the Rhine. He rages against the heretical king of Bohemia and extols Matthias of Hungary. He rails against the Jews for not accepting Christianity and seems to criticize the introduction of Roman law into Germany when he dwells on the force of custom and contends that the consent of the people is needed for laws. This is the chief expression of popular sympathy in the work and it is not very prominent. With it is associated the argument that the legislator should watch the stars which alter the condition of the people and public opinion and so necessitate new laws. Even alchemy is introduced into the discussion. The work of Hermes on fifteen stones and Geber are cited. We are told that as the metals receive virtues from the celestial forms in the successive natural operations which they undergo, so the philosophers have ordained alchemical operations of calcination, solution, separation of the elements, and fixation in the effort to introduce like virtues.[147] Finally, the fact that the work was profusely illustrated with wood-cuts doubtless caught the public eye and increased its circulation.

Lichtenberger's work was attacked by the astrologer Paul of Middelburg in an *Invective* from Urbino of January 1, 1492.[147a] Paul accused Lichtenberger of having plagiarized ex-

[147] Facsimile edition, fols. e i verso-e ii recto.

[147a] *Invectiva magistri Pauli de Myldelburgo vatis profecto celeberrimi in superstitiosum quemdam astrologum et sortilegum una quoque et decem venustas vel astronomicas questiones et sui viginti annorum prognostici olim cum super tetre solis eclipsi tum super magna coniunctione editi dilucidiorem quamdam accurationem precipuorum eius locorum explanationem continens.* 14 unnumbered leaves. BM IA. 49842. At fol. 3v, "Ex Urbino cal. januarii M. CCCC. XCII per Paulum de Mildelburgo

tensively and verbatim from his own prediction from the conjunction. Otherwise everything practically that Lichtenberger had said was wrong, and he had grossly violated the rules of astrology. But this criticism failed to check the popularity of Lichtenberger's prognostication.

Domenico Maria Novara was born at Ferrara and taught astronomy and astrology at Bologna from 1483 to 1504[148] with the added duty of making judgment and *Tacuinum*.[149] Of his judgments that for the year 1489 has been preserved in print.[150] He was a doctor of arts and medicine. Copernicus and Rhaeticus are said to have studied under him. For some years Hieronymo Manfredi was his colleague in astrology at Bologna. Another Hieronymus, further named Salius Faventinus, dedicated to him his edition of Ptolemy's *Quadripartitum*. His sepulchral inscription praises him for giving accurate astrological predictions:

Qui responsa dabat caeli internuntius ore
Veridico fati sidera sacra probans.[151]

Hain lists astrological judgments by Marcus Scribanarius for the years 1482, 1486, and 1494; Accurti, one for 1485 in Latin; and Hellmann, others from 1479 to 1498. I have seen that for 1495 in Italian addressed to Ascanio Maria Sforza, vice-chancellor of the Holy Roman Empire and cardinal legate of Bologna.[152] This opens with twenty-four astrological presuppositions; the first being the conjunction of Saturn and Jupiter in Scorpio in 1484, the second the eclipse of the sun in Libra in 1493, the third the conjunction of Saturn and Mars early in 1496 in Pisces, the fourth the solar eclipse of March 7, 1494, and the fifth the opposition of the luminaries on March tenth. Seven suppositions then deal with the planets, and the remaining twelve with the signs. Twelve chapters of prediction follow, beginning with the crops and closing with the weather, while the intermediate sections are devoted to such topics as students and merchants, ladies, Venetians, Florentines, and Bolognese.

Among predictions for the year 1495 was that of Baptista Gemmatus of Cesena, while Antonio Manilio printed at Forlì a prognostication in dialogue form which looked forward to 1500 and beyond. Ludovicus Lucianus, doctor of arts and medicine, addressed his forecast for 1496, not to some prince or prelate but to his fellow physician and astrologer, Antonio Arquato. It was issued at Mantua on October 28, 1495.[153] Gemmatus addressed his *Prognosticon* at the beginning to count Rambert Malatesta, but at its close addressed Antonius Laurus, a jurist of Padua, as if the work had been composed at his request, and explained that he had not included the horoscopes of princes because he lacked information as to the true dates of their births and did not wish to expose himself to ridicule by uncertain predictions. This paragraph, dated at Venice on January 6, 1495, is followed by a dozen lines of verse addressed by Gemmatus to his booklet, by his reckoning of eclipses in 1495 for the meridian of Venice, and by lists in two parallel columns of lucky and unlucky days during that year.[154] Gemmatus had closed the annual prediction with the prayer that God might avert all the ills which the stars threatened.

Zelandie bonarum artium et medicine doctorem illustrissimi ducis Urbinum physicum." The remainder of the pamphlet is then devoted to Paul's own *Magne coniunctionis prognosticum viginti annis duraturum* in seven chapters.

[148] Dallari, *Rotuli*, I, 121-185; in the faculty lists he is called merely Dominicus Maria de Ferraria, the name Novara not appearing.

[149] "Ad astronomiam de mane diebus continuis et ordinariis. (Et fiat iudicium et tachuinum.)"

[150] Dominicus Maria Novara, *Pronosticon anni 1489* (Bononiae, Bazalerius de Bazaleriis exeunte a. 1488 vel ineunte a. 1489), quarto, 4 fols. See Thos. Accurti, *Editiones saec. XV pleraeque bibliographis ignotae*, Florence, 1930, No. 112.

[151] Tiraboschi, Milan, 1824, VI, i, 588-590.

[152] "Iudicio de Marco scribanario da Bologna sopra la dispositione de lanno presente 1495 al Illustrissimo Reverendissimo in Christo patri et signore meser Ascanio maria Cardinale Sphortia di Vesconti Vicecanceliero dela S.R.E. et legato de Bologna." It opens: "Chilon lacedemonio philosopho sapientissimo deli tempi suoi. . . ." It is the eleventh tract in the collection numbered AV.KK.VIII.29 of the Bologna university library.

[153] Hain *7552, *10277, 10699. Hellmann (1917), p. 214, adds a prediction for 1498 by Gemmatus.

[154] Hain *7552: I have used a copy in the Staatsbibliothek, Munich, 6 leaves. Fol. 1r, "Ad magnificum atque illustrem comitem Rambertum Malatestam comitem Sugliani etc. Baptiste Gemmati Cesenatis pro anno 1495 Prognosticon. Posteaquam magnifice comes Malatestarum decus mathematicis stu-

For the years 1497 and 1500 there are annual predictions in print by Clementius Clementinus de Ameria,[155] doctor of medicine and claimed by Iacobilli as a native of Umbria.[156] He lectured on philosophy and mathematics at Padua and became Leo X's physician. He published medical works in 1512, but that takes us beyond our period. Iacobilli says that he further wrote on fevers and several works on astrology. Augustinian Valentin predicted for 1496 and 1497.[157] For 1499 predictions were printed at Venice and Florence by Augustinus Beganus of Treviso and Bernardinus Bona Moneta of Tivoli, doctor of laws, and for 1500 by the last named and by Leonardus de Richis of Lucca.[158] Hieronymus Catinellus, doctor of arts and medicine at Ferrara, published predictions for 1496, 1497, and 1499 in Italian and for 1500 in both Latin and Italian.[159] Thomas Murner, the German humanist or satirist, published in 1499, not an invective against astrologers generally, as one might conclude from a citation of it by Thuasne, but against those Swiss astrologers who had predicted the death of the emperor Maximilian.[160] Other predictions for the closing years of the century listed by Hellmann are: for 1498 by Lukas Erndorfer of the university of Ingolstadt and Jakob Randersacker, doctor of arts and medicine at Cracow; for 1499, by Camillus Duranteus; for 1500 by Leonhard von Dobschitze of the university of Cracow and Adam

diis nonnihil opere dedimus. . . ." At fol. 6r, after the text ends, ". . . Omnia tamen que mala stelle minitantur deus omnipotens avertat oro," comes a paragraph headed, "Ad Antonium Laurum Iurisconsultum Patavinum," and opening and closing, "Habes tandem comes Palatine quod amicorum gratia tantopere expetebas quod de anno futuro sentiamus . . . / . . . et me ut facis ama. Venetiis 8 Idus Ianuarias anno salutis 1495." The prediction of eclipses and lucky and unlucky days occupy fol. 6v.

[155] Hain *5449. Hellmann (1917), p. 212: He interprets "Ameria" as Vicenza.

[156] Iacobilli, *Bibliotheca Umbriae,* Foligno, 1658.

[157] Hain *15762-15764. Hellmann (1917), p. 219.

[158] GW 3764, 4641, 4642; Reichling 1858.

[159] Hellmann (1917), p. 212.

[160] Louis Thuasne, *Roberti Gaguini epistolae et orationes,* 1904, II, 30, gives the title merely as *Invectiva contra astrologos,* to which should be added *Switenses interitum Maximiliani praedicentes.* It was printed at Strasburg, 1499, in quarto.

Eckstain of Schwäbisch Hall and Giacomo Pietromellaria, doctor of arts and medicine at Bologna.

But the prediction of the closing fifteenth century which appears to have created most stir and popular apprehension was that of a second deluge which would end the world on February 25, 1524. This prediction had its origin in an almanach by Johann Stöffler von Justingen (1451-1531), under whom Melanchthon studied, printed at Ulm in 1499.[161] Its history, however, belongs chiefly to the sixteenth century.

Astrological aphorisms by Ludovicus de Rigiis seem not to have been printed until 1535.[162] But since they then appeared in the same volume with the *Tetrabiblos* of Ptolemy and the fourteenth century astrological work of Guarimbertus, they may have been composed long before 1535, and inasmuch as this same Ludovicus edited in 1488 the *De esse et essentiis* ascribed to Aquinas,[163] we would seem reasonably safe in assigning his *Aphorismi astrologici* to the closing fifteenth century. As examples of their tenor we may note the fifteenth that a person who has Saturn retrograde in the ninth house or ascendent of his nativity will never be a faithful prophet or pontiff or leader of ecclesiastics, the thirty-fifth that they are true sons of God who are born under a maximum conjunction, and the one hundred and twenty-fourth that those women are to be feared who in their nativities have planets in masculine places. The one hundred and sixteenth asserts that this science of astrology is not through sophisms and evasions but through reality and experience.

Among past celebrities of Vienna, Tannstetter, writing in

[161] *Almanach nova plurimis annis venturis inservientia* (i.e. 1499-1531), per J. Stoefflerinum . . . 1499. It is remarkable that the prediction should have covered exactly to the year of Stöffler's death.

[162] *Aphorismi astrologici Ludovici de Rigiis ad patriarcham Constantinopolitanum,* fols. 72r-83r, in the volume opening with Ptolemy's *Tetrabiblos* and the Latin translation of Joachim Camerarius, Nürnberg, 1535, Ioan. Petreius. The patriarch is not named and so affords no clue as to date.

[163] Printed at Venice by Santritor (Santritter) and de Sanctis: *Catalogue of Books printed in the XVth Century Now in the British Museum,* V(1924), 462.

1514, noted Johann Müntz, a canon in the cathedral there and bachelor of sacred theology, who died in 1503 and whom he ranked second to no one of his contemporaries in astrological knowledge and prediction.[164]

[164] See Tannstetter's introduction to the *Tabulae eclypsium* of Peurbach, Vienna, 1514.

CHAPTER LIX

MAGIC IN DISPUTE, I

PICO DELLA MIRANDOLA, BERNARD BASIN, PEDRO GARCIA

One cannot but feel that the importance of Pico della Mirandola in the history of thought has often been grossly exaggerated. What did he amount to, compared to a Duns Scotus, or Bartolus, or Peter of Abano, or Lorenzo Valla? The darling of enthusiasts for the so-called Italian Renaissance, his reputation must decline with its. Why should we today be compelled to assent to loose eulogies of the sublimity of his mind or the many-sidedness of his learning? More of a scholastic disputant than a humanist, and not so good a Hebrew scholar as Raymond Martini or Nicholas of Lyra, he did little but add to medieval scholastic interests the Platonism and mystic theology of Ficino. His genius was precocious, and in life he was an attractive, compelling personality. But the works which he left behind him suffice only to fill a single large volume. They are occupied to such an extent, however, with magic, the cabala, and astrology, that they possess for our particular investigation a significance out of proportion to that which their author seems to merit in the general history of thought. They will therefore claim our attention both in this and a succeeding chapter. We do not devote a single chapter entirely to Pico but rather separate his earlier attitude and his later attack on astrology between two chapters, partly in order to associate them with other views held simultaneously by other men, partly because Pico's later attack on astrology to some extent represented a right about face from his earlier attitude.

When Pico della Mirandola at the age of scarcely twenty-four came to Rome and proposed for public disputation his nine hundred theses, offering to defray the traveling expenses from any

part of Italy of anyone who would argue them with him,[1] the learned men of the time were less inclined to dispute with this callow, if precocious, lad from Florence than they were to condemn his presumption in venturing at his age to attempt to cover so vast a field. Pico was not the first juvenile phenomenon of this sort to burst upon the learned world of scholasticism in the fifteenth century. Back in the forties a boy marvel named Fernandus of Cordova had come forth from the Spanish peninsula. He was reported to know all languages, had a wonderful memory for authorities, and was already a doctor of law, medicine, and theology. Various chronicles and letters of the time are full of him. He was something of a knight errant as well as traveling disputant, since he came with eight horses and was ready either to joust or argue. He corresponded with Lorenzo Valla, and impressed Charles VII of France favorably in an interview at Châlons. The "king of Bourges" seems to have been susceptible on such occasions to young wonders of both sexes, whether a Joan of Arc or a Fernandus of Cordova. But when Fernandus reached Paris, late in 1445, he did not keep his promise to visit the university and to meet all comers in disputation and was consequently arrested by the university.[2] He was soon released and allowed to visit the duke of Burgundy and is said to have predicted by astrology the fate of Charles the Bold. He was deep

[1] Giovanni Francesco Pico della Mirandola in his *Vita* of his uncle, states that Pico waited a year without anyone accepting his offer, but he appears to have overestimated the time. Léon Dorez and Louis Thuasne, *Pic de la Mirandole en France (1485-1488)*, Paris, 1897, pp. 56 and 59, state that Pico's theses were first printed about the beginning of December, 1486, and that Innocent VIII, yielding to the reiterated complaints of the theologians at Rome, on February 20, 1487, constituted a committee to examine those propositions among them which were suspected of heresy. Possibly the theses had been posted before they were printed, but a letter of November 12, 1486, from Pico to Girolamo Benivieni, seems to indicate that they had then been only recently completed, since Pico states that they had increased from 700 to 900 and would have reached a thousand had he not reduced the number. Dorez et Thuasne, *op. cit.*, p. 55. In any case, Pico himself tells us in his *Apologia* that disputation of the theses was not to begin until after Epiphany.

[2] *Auctarium Chart. Univ. Paris.*, II (1897), 632-633 and 635; and, for the other details of his career, Bonilla y San Martin, A. and Menendez y Pelayo, M., *Fernando de Córdoba (1425-1486?) y los orígenes del renacimiento filosófico en España*, 1911, pp. 53-79. Also Julian Havet, *Mémoires de la soc. de l'hist. de Paris*, IX, 192-222.

in the problem whether the Platonic or Aristotelian philosophy is superior, a question which was also to intrigue Pico, when cardinal Bessarion set him to what should have been the congenial task of writing a treatise on a single art of knowing everything[3]—an attempt to improve on Lull, whose previous effort he dismisses as a dismal yet ridiculous failure. His own essay is primarily a matter of logical method and classification, but contains some interesting general assertions in the domain of natural science, such as that there are fifty leading species of precious stones, twelve metals, ten kinds of marine animals. Of reptiles he lists sixty-three varieties, of swimming animals 136, of herbs 169. This work, so far as I know, remained unprinted, which was no great loss to science. There are further ascribed to him in manuscripts a commentary on Aristotle's *Metaphysics*[4] and a treatise on diagnosis from urine.[5] Such was the background of Pico's splurge. Fernandus died at Rome in 1486, just too soon to have disputed Pico's theses with him.

In promulgating his nine hundred theses Pico explained at the start that in stating these propositions he had not employed the smoothness of correct classical Latin which was the ideal aimed at by the humanists, but the kind of diction customary with the most celebrated disputants of Paris and other philosophers of his day. Pico was then fresh from a residence at Paris which seems to have lasted from July, 1485,[6] to March, 1486.[7] Among his theses many dealt with magic and the cabala. Of these per-

[3] Vatican 3177, De artificio investigandi et inveniendi natura scibiles ad Bessarion Cardinalem, 62 fols., incipit, "Quos vides inter scholasticos et prestanti ingenio viros. . . ." At fol. 2r he describes his undertaking and Bessarion's turning him to it: "Artes ergo diverse in diversis scientiis et diversis scibilibus esse non possunt nisi artium multitudinem in singulo scibili in artem referas quae omnis scibilis unica ars sit. Est igitur unica et indivisibilis ars qua omne natura scibile et investigari et inveniri possit. . . . Et tuo iussu et mea promissione debita. Nam de duabus philosophiis idest Platonis et Aristotelis utra alteri prestet disserentem me subito et cursu suo revocavit voluntas tua. Quippe qui iussisti intermictendum esse opus et in artificium omnis investigandi et inveniendi scibilis calamum esse referendum."

[4] Oxford, Merton College 281, fol. 40.

[5] Vatican, Reg. Suev. 1773, fols. 49r-61r, De secretis humane dispositionis per urinam dignoscendis ad nobillissimum virum Guidonem Barbuti.

[6] Dorez et Thuasne, *Pic de la Mirandole en France (1485-1488)*, Paris, 1897, p. 34, citing D. Berti, in *Rivista contemporanea*, Turin, 1859, p. 12.

[7] Dorez et Thuasne, *op. cit.*, p. 44.

haps the most startling, included among the thirteen propositions which were condemned as bordering upon heresy, was the thesis that there is no science which gives us more certainty of the divinity of Christ than magic and the cabala. Various other of his propositions were favorable to natural magic.

Pico was not the only scholar of the time to advance or debate such theses, however. Had he only been at Paris two or three years earlier, he might have heard such a discussion at the "Vespers" of a candidate for the master's degree at the university of Paris in 1482. The candidate or *Vesperiatus* appears to have maintained that the study of the magic arts aids the salvation of the faithful. His arguments do not seem to have reached us, but we possess in a manuscript of the Bibliothèque Nationale at Paris[8] as well as in an incunabulum of 1483[9] and other editions,[10] a contrary argument of doctor Bernard Basin, a canon of Saragossa, before the rector and university on either the same or a similar following occasion.[11] Towards the close of his argument Bernard observes:

From the foregoing I infer that the magic arts which involve invocations of demons and pacts with them are justly prohibited by every

[8] BN 2193, 15th century, fols. 170r-178v. This I have examined to some extent but follow chiefly the printed text of 1483. From its colophon, the MS seems to have been copied from the printed edition by Antonius Caillaut, Paris, n.d. which is dated as "about 1492" by GW 3720 (probably this is what Hansen refers to as the edition of 1482): "Explicit tractatus de magicis artibus et magorum maleficiis impressus Parisius per anthonium caillaut." The wording of the titulus in the MS differs slightly from that of the printed edition.

[9] *Tractatus exquisitissimus de magicis artibus et magorum maleficiis per sacre scientie parisiensem doctorem Magistrum bernardum Basin Canonicum Cesaraugustanensem in suis vesperiis compilatus Anno a natali christiano Millesimo. cccc. lxxxii:* Paris, Louis Martineau, 1483: GW 3719, Pellechet 2004. I examined the work in the Pierpont Morgan library, New York: see James and Pollard's catalogue of the same, No. 490. Either Pellechet is mistaken in suggesting Guido Mercator as the printer or there is still a third edition. Pellechet lists copies in France as follows: BN E. 2335; Arsenal T. 3559A; Besançon 179. Subsequent citations, unless otherwise designated, will be from the edition contained in the Pierpont Morgan library.

[10] See Joseph Hansen, *Quellen* (1901), p. 236, for a list; some were printed with the *Malleus maleficarum.*

[11] It should of course not be inferred from the expression, "in suis vesperiis," in the title given in note 9 that Basin himself was on this occasion a candidate for a degree, since he was already a doctor of theology. It was customary for such advanced masters to participate in the candidate's disputation.

form of law as evil and subversive of all polity. The opposing argument to this was upheld by that man of distinguished intelligence, the master and lord who has just (or, very recently) taken his Vespers, saying in similar case that the study of the magic arts promotes the salvation of the faithful.[12]

Moreover, in opening his disputation Bernard described his audience as "most attentive in listening to discussions of the magic arts."[13] This would seem to imply that magic provided a theme for scholastic disputations fairly frequently at that time, and perhaps also that the growing witchcraft delusion was beginning to attract attention at the universities.

In this connection it may be noted that in 1466 the university of Paris had been called upon to pass on certain books of the magic art belonging to the astronomer, master Arnold Desmarets, and to determine whether they were consonant with the catholic faith and sound Christian doctrine. On October 28, 1466, royal letters to this effect were read publicly before the university assembled at S. Mathurin; twenty-seven or twenty-eight volumes large and small were laid before them; and deputies were appointed from every faculty and nation to examine the books. On November 10, the university met again at S. Mathurin to hear their report, in consequence of which at a third meeting held two days later at S. Mathurin a minute was drawn up and adopted to the effect that such books "contained many superstitions, many manifest and horrible conjurations and invocations of demons, many concealed heresies and open idolatries," and that they

[12] Edition of 1483, fol. (b.v.) verso: "Ex supradictis infero quod artes magice que invocationes demonum et pacta cum eis consulunt merito omni iure sunt prohibite quia male et perturbative omnis policie cuius oppositum tenuit preclare intelligentie vir magister et dominus novissime vesperiatus in simili actu dicens quod studium magicarum arcium valet ad salutem fidelium."

[13] The text opens in the edition of 1483: "Quom (*Cum* in BN 2193) vos in audiendis magice artis disceptationibus attentissimos conspicio et rei magnitudinem meis oculis subicio, Illustrissime ac reverendissime domine purpurati cetus particeps et sacri consilii membrum, spectabilis rector, sacre milicie duces, proiudices incorrupti, aurati milites, et vos sacratissimi dei studii expositores a quibus abditissima queque doctrinarum omnium intelliguntur . . ."

should be condemned and communicated to no one. An ambassador was appointed to carry the university's decision to the king.[14]

A closer parallel to Basin's discussion of the subject is found at the university of Heidelberg back in the year 1424. On the first leaf of a volume of magic lore,[15] which would probably have been condemned by the university of Paris had it been brought before them in 1466, is a personal memorandum or diary by a German student, Conrad Buitzruss, of his activities from his fifteenth to twentieth year or during 1422-1427. In 1424 he was examined for the degree of bachelor in arts at Heidelberg, and the subject of his thesis was whether in a good polity it is lawful to believe, practice, and study magic arts. No doubt the magic miscellany which follows in the manuscript and of which the copying was completed on July 30, 1424,[16] just before Conrad's examination in August, was useful to him in dealing with this question, although he might seem rather young to be dabbling in magic lore at the age of seventeen. Here, however, was further precedent for Pico.

Our Bernard Basin is mentioned in Burchard's diary as preaching in 1492 in S. Maria supra Minerva before nineteen cardinals with much success.[17] He was, of course, a different person from Basinio da Parma, born in that city in 1425, of whose astronomical poem Soldati has treated.[18] Quite a different person, too, was

[14] Du Plessis d'Argentré, *Collectio judiciorum de novis erroribus,* 1755, I, ii, 256: previously printed in *Acta ad jurisdictionem Universitatis Studii Parisiensis,* p. 3; and in Bulaeus, *Hist. Univ. Paris.,* V, 678. See also Feret, *La faculté de théologie de Paris au moyen âge,* IV (1897), 134; Crevier, *Histoire de l'université de Paris,* IV, 308.

[15] CLM 671, fol. 1r-v: for the Latin text see *Speculum,* IV (1929), 88-89.

[16] CLM 671, fols. 2r-127r, "Liber diversitatis ex diversis latinorum, graecorum, astronomorum, nigromanticorum, geomanticorum, Chaldaeorum et Hebraeorum libris." At its close we read: "Finitus est ille liber sub anno domini 1424 in die tricesima mensis Julii sole existente in 16° gradu leonis hora saturni indictione secunda de quo laudetur conditor conditorum et magister omnium astronomorum cum virgine maria que sit nobis misericors et pia. Amen." The remainder of the manuscript, to fol. 182v, is in another hand and becomes even more magical in character.

[17] *J. Burchardi Argentinensis Diarium,* ed. Thuasne, 1883, I, 448: cited by Hansen, *Quellen,* etc., p. 236.

[18] B. Soldati, *La poesia astrologica nel quattrocento,* Firenze, 1906: cap. I, pp. 74-104.

Thomas Basin (1412-1491), born at Caudebec and finally bishop of Lisieux. In the meantime he was professor of law at Louvain and vicar general of Utrecht. Under the pseudonym, Amelgard, he wrote a history of the reigns of Charles VII and Louis XI.[19]

The question debated by Bernard Basin was whether by the doctrine of Christ all the faithful are purged from the sorceries of the magicians.[20] This question, he explains in closing, had been set for him by a doctor of canon law, to whom and the theologians present he submits his argument for correction.[21] Passing over his quotation of Pliny, Ovid, and Augustine as to the origin and meaning of magic, we may note nine preliminary propositions which he lays down. The first is that many things can be shown and done by the illusions and sorceries of magic which seem marvelous to those who behold them and do not understand their cause. But these apparent marvels are to be ascribed neither to the influence of the heavenly bodies nor to the virtue of the human intellect. The various artificial objects which magicians employ also have no effective virtue in them, and the same holds true of images and incantations. Basin thereupon concludes that the marvelous effects of magic art are worked by separate intelligences who participate in them, in other words, by demons who have such power by divine permission over corporeal things that they can even move mountains. He grants, however, that persons with the power of fascination may be able to alter the tender bodies of infants by their mere evil eye without coöperation of the demons.

From these nine preliminary propositions, which we have summarized in slightly different order, Bernard proceeds to the question how far the indulgence in such diabolical magic involves one in the charge of heresy. He here makes a number of deli-

[19] Ed. Quicherat, Paris, 1857.

[20] Edition of 1483, fol. a. i verso, "Utrum christi doctrina fideles omnes a magorum maleficiis purgentur."

[21] "Infero finaliter quod Christi doctrina fideles omnes a magorum maleficiis purgantur. Quod est correlarium responsivum ad questionem per sacre legis doctorem michi propositam, cui et vobis divinarum litterarum in terris arbitris dicta mea submitto corrigenda." The colophon, as given in note 8, follows.

cately graded and carefully differentiated distinctions. If a person who invokes a demon either expressly or tacitly with sacrifice and adoration, does so in the belief that the demon is God, he is a heretic. If he does so in the belief that the demon is a friend of God, he is likewise a heretic. If he recognizes that the demon is persistent in evil, but holds that it is nevertheless no sin to invoke him, he is still a heretic. If, however, he recognizes that it is sinful to invoke demons but nevertheless commits the sin, he is not a heretic but simply a sinner, although Basin then adds, "but perhaps he should be regarded as a heretic."[22] If one seeks from the demon what is beyond the demon's power or believes that the demon can grant such requests, that is heresy, as is the attempting of feats which infringe upon human free will or the belief that the demons can force human free will. Heretical, too, is the belief that demons can perform such feats as wrecking a house without divine permission, or the seeking from them of forecasts of the future which do not have determinate causes in nature. Dreams of the future are not necessarily the work of demons, although their source may be diabolical, but geomancy, hydromancy, pyromancy, and even chiromancy are all represented by Basin as dependent on demon aid. It is furthermore heresy to seek for knowledge of the future under the impression that the demons can predict accurately and surely what they in fact can only conjecture with some approach to probability. Finally, it is heretical to imagine that the demons will always infallibly reveal even that which they do know certainly, since they are sinful liars and ever prone to deceive mankind.

Basin goes on to argue that such magic arts involving the invocation of demons and pacts with them have been prohibited by all laws, civil and canon alike. If anyone says that it is lawful to study them in order to confute and condemn them, he cannot agree with him, first because such study takes up time that might be employed in useful arts, second because man's natural curiosity and interest in the marvelous is apt to draw him on

[22] ". . . licet pro heretico sit habendus."

into too intensive study of them. Therefore he concludes that the magic arts should not be tolerated either at Toledo or Salamanca or in any other part of Spain (*Hesperie*) at this time.[23] A tale follows of a marble idol in a deep cave at Salamanca where in ancient times by demon aid men used to become proficient in working marvels. But the cave has long since been closed up, a church erected over it, and the idol so trodden under foot by passers-by that scarce a vestige of its sculpture remains. Such is the incompatibility of magic arts with Christian doctrine.[24]

Hansen, perhaps misled by such allusions to Salamanca and Spain, gives the impression that Bernard's treatise was composed at Saragossa in 1482.[25] But while Basin was a canon of Saragossa, it seems clear that his disputation was at Paris, as we have already stated.

But to return to Pico della Mirandola whom we left at Rome waiting until Epiphany when the disputation of his nine hundred theses was to begin. Instead their publication scandalized certain Roman theologians who felt that some articles were not properly defined and stated for purposes of disputation, and that others deviated dangerously from orthodoxy. Although Pico had previously been well received at the papal court and allowed to borrow books from the apostolic library, pope Innocent VIII was induced to appoint a commission to examine the theses "lest the minds of the faithful, and especially of simple persons who are wont to flock to public disputations of this sort, be corrupted."[26] Pico was called before this commission of bishops and

[23] Edition of 1483, fol. (b.vii) recto, "Et sic patet confutatio-sui dicti. Ex quibus simul cum optima illius regni policia infero quod nec apud toletum nec apud salamanticum aut quamlibet aliam hesperie partem hac tempestate magice artes tollerantur."

[24] Basin then ends his treatise with the sentence quoted in note 21.

[25] Joseph Hansen, *Zauberwahn, Inquisition und Hexenprozess im Mittelalter*, 1900, p. 447: "In Spanien, wo Alfons Tostatus und Johann von Turrecremata um 1440 den Hexenflug bereits wissenschaftlich begründet hatten, schrieb 1482 der Kanonikus zu Saragossa, Bernard Basin, seinen Tractatus de artibus magicis."

[26] The words here translated are those of Alexander VI in rehearsing the previous history of the case in his letter to Pico finally absolving him from any suspicion of heresy. Innocent VIII, however, used very similar language in his letter constituting the commission: "si enim diucius indiscusse dimit-

professors; his explanations of the theses under attack failed to satisfy them; three articles were declared false, erroneous, and heretical; four were called rash and heretical; and six more were condemned less categorically.[27]

In his nine hundred theses Pico showed that his thinking was largely colored by astrology, that he was favorable to natural magic, and that he had a penchant for such occult and esoteric literature as the Orphic hymns, Chaldean oracles, and Jewish cabala. Among his conclusions according to Porphyry are these: that every soul participating in a Vulcanic intellect is sown in the moon, that from this it follows why all Germans are of good stature and blond and most reverent towards the apostolic see, that just as Apollo is of solar intellect so Aesculapius is of lunar intellect, and that *ergo* the moon in the ascendent gives health to the one born then. Or from Hermes Trismegistus he derives the thesis that God announces the future to man in six ways: by dreams, portents, birds, intestines, spirit, and Sibyl. Or, "speaking Platonically of the soul," he affirms that it lives a contemplative life with Saturn, a political and practical life with Jupiter, an irascible and ambitious life with Mars, a life of concupiscence and pleasure with Venus, with Mercury a vegetating and stupid existence. In other words, those planets have these effects upon men's lives. Of an individual's life the first seven years are under Mercury, the second seven under Venus, the third under Mars, the fourth under Jupiter, the fifth under Saturn, and the rest of his life under whichever planet predominated in his case.

Demons also claim Pico's attention. Porphyry leads him to assert that there are two kinds of evil demons, one substantial souls, the other accidental material powers. Or with Proclus he speaks of four armies of junior gods, the first from the first heaven to the beginning of the air, the second in the upper air,

terentur, vereri similiter possent (*sic*) ne fidelium mentes et pie aures plurimum offenderentur." Dorez et Thuasne, p. 116; the entire "Procès de Pic de la Mirandole," reproduced from a MS at Malines, covers pp. 114-146.

[27] Dorez et Thuasne, pp. 65-66.

the third in the lower air—and the fourth presumably aquatic or subterranean, but he fails to state. Or with the cabala he states that no angel having six wings is ever transformed.

The temper of Pico was indeed far from scientific. He was apt enough in the type of scholastic terminology and fine-drawn distinction that posterity was to ridicule, and in his forty-seventh conclusion from Plato described Providence as statuitively in God, ordinatively in intelligence, executively in the soul, denunciatively in the sky, terminatively in the whole universe. But he was ready to argue with Averroes that there could be no natural habitation for living beings south of the equator or with Avicenna that it was possible for man to be generated from putrefaction. And he thought nothing more harmful for a theologian than frequent and assiduous exercise in the mathematics of Euclid.

Natural magic was a conception more palatable to Pico's paradoxical and marvel-mongering mind than was mathematical discipline or scientific method. His twenty-six conclusions anent magic begin with the admission that all the magic in use among moderns is deservedly condemned by the church and has no foundation, but that natural magic is licit and not prohibited and is the practical and most noble part of natural science, and that there is no potential or separate virtue in earth or sky that the magician can not actuate and unite. Indeed the marvels of the magic art are not worked except by union and actuation of those forces which exist in embryo and separately in nature. But furthermore no operation of magic of any efficacy can be performed unless it has annexed a work of the cabala explicit or implicit. Words and utterances have efficacy in magic but only if they are in Hebrew, the original divine language. Numbers, figures, and characters are also efficacious. But Pico has already taken the precaution to say that the miracles of Christ could not have been wrought by either magic or the cabala. In his *Oration on the Dignity of Man,* with which he intended to open his disputations, Pico again distinguished the two kinds of magic and admitted somewhat superciliously that Alkindi, Roger Bacon,

and William of Paris had anteceded him in the conception of natural magic. Why did he fail to mention Albertus Magnus as well?

As for the Orphic hymns, there is nothing more efficacious in natural magic. The names of the gods sung by Orpheus are not those of deceiving demons but of natural and divine virtues distributed by the true God toward human utility. As for the cabala, Pico contends that it attests the Christian doctrine of the Trinity, enables us to foretell the end of the world, and, combined with astrology, proves that since the coming of Christ Sunday should replace Saturday as a day of rest. But he admits that there is danger of death from spirits to the careless cabalistic operator.

Such are a few specimens from Pico's numerous theses involving astrology, divination, and demonology, or directly concerned with magic, Orphism, and the cabala. They suffice to show where he stood with respect to magic and experimental science. Only one of all his theses of this sort was condemned by the commission, however, namely that in which he held that there is no science which makes us more certain of Christ's divinity than magic and the cabala.

Despite his condemnation by the commission or because of it Pico produced an *Apology* which was printed at Naples by Francesco del Tuppo.[28] This edition bears the date, May 31, 1487,[29] which has, however, been questioned.[30] In it he defended the aforesaid thirteen propositions and accused those who had condemned them of heresy in their turn, while in his introductory remarks, written in an oratorical style with many mentions of names of classical authors and pagan philosophers in order to appeal to the humanists of the time, he implied that his opponents were stammering barbarians.[31] The report that such a work

[28] Fava e Bresciano, *La stampa a Napoli nel XV secolo,* II (1912), 59, No. 69.

[29] *Idem,* "Die ultima Madij. Anno domini Mcccclxxxvjj."

[30] Dorez et Thuasne, p. 68; Berti, "Intorno a Giovanni Pico," *Rivista contemporanea,* Turin, XVI (1859), 17-18, 38-39, 52; Cappelli, *Lett. di Lor. de' Medici,* p. 68, et n. 2. The pope held that it appeared after his bull, while Pico contended that it appeared before he knew of the bull. He seems to admit, however, in a document of 27 August 1489 that his *Apology* appeared after his submission of July 31, 1487.

[31] *Apologia,* in 1572 edition of his *Opera,* pp. 124-125.

had been composed or published caused the pope on June 6 to appoint two bishops with inquisitorial power to deal with those involved. Pico made his submission to the commission on July 31, and on August 4[32] the pope issued a bull condemning the nine hundred theses and forbidding their being printed, copied, or read, but because of his submission exculpating Pico from any infamy.[33] When, however, Pico fled to France, the pope ordered his nuncios there to have him arrested. The pope also issued apostolic letters condemning the *Apologia.*[34] Pico was arrested in Dauphiné and was detained for a time in the donjon of Vincennes. But the nuncios were not anxious to have him brought to Paris, where there might have been a movement in his favor. However, the statement which has sometimes been made that the Dominicans of Paris defended him against Rome seems without foundation except that during his stay at Rome he had found two supporters[35] whose earlier connection had been with Paris, while some of his theses represented the teachings of Parisian schoolmen. He therefore was allowed to return to Italy, with royal letters in his favor, to make his peace with the pope as best he could. Lorenzo de' Medici also interceded for him, and he was allowed to remain at Florence, but with his orthodoxy under a serious cloud despite further Medicean efforts on his behalf until the succeeding pope, Alexander VI, absolved him and ordered the inquisition not to trouble him in this matter.

It has been necessary to repeat these facts as an introduction to the work of which we are now to treat, since it consists of a reply to Pico's aforesaid *Apology,* addressed to Innocent VIII by Petrus Garsia or Pedro Garcia, bishop of Ussellus in Sardinia[36] from 1484 to 1490, when he became bishop of Barcelona.[37] He had been a member of the commission appointed to examine

[32] Dorez et Thuasne, p. 69.

[33] *Bullarium, Taurinensis editio,* V (1860), 327-329.

[34] Dorez and Thuasne, pp. 70-88, 146-156.

[35] One of them, Jean Cordier, was a member of the examining commission.

[36] *Petri Garsie Episcopi Usselen. ad sanctissimum patrem et dominum Innocentium papam VIII in determinationes magistrales contra conclusiones apologiales Ioannis Pici Mirandulani Concordie Comitis proemium.* Impressum Rome per Eucharium Silber alias Franck natione alemanum ab anno nostre salutis M.CCCC.lxxxix die vero XV mensis Octobris.

[37] Eubel, *Hierarchia,* II, 286.

Pico's original nine hundred theses.[38] It is noteworthy that both Basin and Garcia were Spaniards. We shall be concerned only with Garcia's reply to Pico's thesis that "there is no science which gives us more assurance of the divinity of Christ than magic and the cabala." It occupies, moreover, a large fraction of his work.[39]

In his *Apology* Pico explained his condemned thesis that there is no science which makes us more certain of Christ's divinity than magic and the cabala, as applying only to natural science and not revealed theology and as meaning that these studies helped to prove that Christ's miracles could not have been natural and so must have been divine. He now perhaps stressed the natural character of this magic even more than before, describing it as studying "the virtues and activities of natural agents and their mutual applications and proportions," and as "that practice of natural science which presupposes exact and absolute knowledge of all things of nature." He added that he had in mind "that part of the cabala which is science and not revealed theology . . . that part which is concerned with the virtues of the heavenly bodies." He now appealed at some length to the authority of William of Paris for support of the conception of natural magic, and this time mentioned Albertus Magnus as one experienced in it. He continued, however, to defend the use of figures and characters in magic, adducing the Pythagorean philosophy as more favorable to the virtue of numbers than the Peripatetic, and citing Hilary for the story that the Psalms had been numbered with a view to their virtue and efficacy rather than arranged in chronological order of composition. He further cited Jerome and other church fathers for the badness of the number two—of the second day of creation it was not said, "And the Lord saw that it was good," because the number two is evil—and the perfection of other numbers. Similarly Origen was cited for the power of names and their loss of virtue if translated out

[38] Dorez et Thuasne, p. 61.

[39] The last signature of the printed text is r.iii. The discussion of magic and the cabala runs from fol. h.iiii recto to fol. o.iii recto, covering all the intervening signatures for k, l, m, and n. There are no signatures for i or j.

of the Hebrew into another language. As for the Hebrew cabala, Pico explained that it was not the name of a man who had written voluminously against Christ, but the unwritten law of secret mysteries revealed by God to Moses and alluded to by such subsequent sacred writers as Esdras, Paul, the Gospels, Hilary, and Origen. "This is the first and true cabala of which I believe I am the first among the Latins to have made explicit mention." It really consists of two sciences or branches. The first is an art of combining not dissimilar to the art of Raymond Lull. The second deals with the virtues of superior things which are above the moon, and is the supreme part of natural magic. It was this defense of the thesis lauding magic and cabala that Garcia was especially concerned to rebut.

Garcia takes up a position of extreme opposition to magic of any sort. For him all magic is evil and diabolical, and is rationally prohibited by every legal and religious system. It is contrary to the catholic faith and to natural philosophy. He will not grant that in addition to this illicit and prohibited magic there is a natural magic which is lawful and not forbidden, as Pico had contended in his *Apology*. In it Pico had explained that he approved only of natural magic, saying,

> Similarly when men read that Albertus spent much time in experiment of magic, let them understand this of natural magic, not of the prohibited variety, lest from the example of so great a man they devote themselves thereto, presuming that what was permitted him is also permitted them.

Garcia denies that natural magic is a part of natural science, as William of Auvergne, bishop of Paris, had believed and asserted in his *De legibus*.

Garcia will not even admit the conception of occult virtues in nature, or at least he will not admit that such virtues can be known and employed by men. Since such virtues "evidently cannot be learned by human investigation," they must be known and used by demon aid. He does not think it probable that there are any virtues in natural objects which cannot be learned by reason

and experience, and he holds that the occult virtues which the magicians assume are proved neither by reason nor experience, "as appears from the uncertainty and deceptive quality of magic works." He shuts his eyes to the fact that occult virtues were always said to be learned by experience, but his very rebuttal is interesting as testimony that the magicians claimed to base their feats upon occult virtues in nature. He further objects that if imperfect creatures such as herbs, stones, and the lower animals possess these marvelous occult powers, much more should man have them, which is not the case. Here he seems to ignore the fact that every devotee of magic claimed such powers for man and especially for the magician. He adds that Aristotle recognized no such virtues in his natural philosophy.[40]

Garcia does not venture, however, to deny the virtue of the magnet nor that of jasper to check flux, but he contends that these reduce to virtues commonly experienced, and that, conceding their existence, it is impossible for the human intellect to comprehend such virtues distinctly and certainly. To this argument the magicians would of course retort that it was not necessary to understand them fully in order to make them work. Garcia continues that such virtues are not due merely to the power of matter but to the added influence of the celestial bodies, intelligences full of forms, and the First Cause, which too the magicians would cheerfully grant. Garcia adds that such virtues furthermore corrupt with change of place and time, as "in modern times many stones lack the virtues once attributed to them." Thus he seems to be admitting the very occult virtues which he had denied, but his argument now is that, with such uncertainty and variability attached to them, man cannot use them in art.

After Garcia's denial that experience attests the pretended occult virtues of the magicians, and his denial of the very existence of natural magic, we are surprised to hear him charge

[40] Garsia, *op. cit.*, fol. k, verso, "Aristoteles philosophorum princeps et subtilis inquisitor veritatis sufficienter et complete tradidit et scripsit scientiam rerum naturalium secundum se et omnes eius partes, inter quas non connumeratur scientia virtutum occultarum et mirificarum nature."

against natural magic that it is experimental knowledge concerning singular things and circumstances, in which deception and error are frequent.

Moreover, to assert that such experimental knowledge is science or a part of natural science is ridiculous, wherefore such magicians are called experimenters rather than scientists. Besides magic, according to those of that opinion, is practical knowledge, whereas natural science in itself and all its parts is purely speculative knowledge.[41]

This emphatic affirmation in the late fifteenth century that experimental method belongs with magic and not with natural science I would cordially recommend to the attention of those who have been inclined to criticize the title of my *History of Magic and Experimental Science During the First Thirteen Centuries of Our Era.*

Garcia next enters upon a tortuous argument which seems more favorable to magic and astrology than to his own contention against Pico. First, he affirms that an angelic intellect of its natural virtue can and does know the occult and marvelous virtues of things of nature. We instantly suspect that this premise is to be used to establish the diabolical character of any art employing occult virtues. But he has said "angelic intellect," and he goes on to support his proposition by the reasoning that, according to the philosophers, separate intelligences by the intermediary of the motion of the celestial bodies and of these inferiors cause the aforesaid occult virtues. Therefore such intelligences must understand these virtues. But surely the separate intelligences entrusted by God with moving the planets and spheres and controlling terrestrial phenomena are good, not evil spirits. He proceeds to state that separate substances by their own na-

[41] *Ibid.*, fol. k.ii, r-v, "Hoc etiam probatur ex alio quia magia naturalis est noticia experimentativa que circa singularia et singulares circumstantias versatur, in quibus ut in pluribus deceptiones et errores contingunt. Asserere autem talem noticiam experimentativam esse scientiam vel partem scientie naturalis est ridiculum, unde tales magi experimentatores potius quam scientes appellantur. Preterea magia secundum sic opinantes est noticia practica, scientia autem naturalis secundum se et omnes eius partes est noticia mere speculativa."

tural virtue can produce marvelous effects by the method of art, namely, applying agents to patients. And it is a matter of faith that angels not only move the heavenly bodies but also other bodies, God so ordaining and permitting. Incidentally he makes the damaging admissions that consideration of the heavens and stars is useful in agriculture and medicine, and that those doctors work the more marvelous cures who know the most about the virtues of natural objects. Yet he presently reaches the conclusion that the separate substances by whose aid the magician knows hidden things and performs marvelous works are evil and not good. The main reason for this conclusion seems to be that magic seeks evil ends, but this is ignoring the whole conception of natural and beneficial magic.

If we have been getting the impression so far that Garcia, while opposed to magic, is not unfavorable to astrology, this in its turn is somewhat upset by his definition of magic. After denying as ridiculous that it signifies philosophy or wisdom as a whole and absolutely, he adds, "But it signifies that part of philosophy which is concerned with the course and location of the stars or the occult virtues of superior and inferior bodies."[42] This would certainly seem to be just what he had previously been concerned to deny, and is perhaps not meant to be his own statement. At any rate he goes on to say that according to the Christian religion it should be firmly held that the name magic signifies a certain superstitious art in which by agency of the demons the magician falsely promises to learn things hidden and to work wonders. "And this superstition and fraud many in our time approve, imitate, and defend under the false name of natural wisdom."[43]

It seems evident that so far we have not had from Garcia much more than a mere war of words and dispute as to what the

[42] *Ibid.*, fol. k.iiii, recto, ". . . sed significat partem illam philosophie que de astrorum cursu et situ est aut de virtutibus occultis superiorum corporum et inferiorum."

[43] *Ibid.*, fol. k.iiii, verso, "Cuius superstitionem et fraudulentiam sub falso nomine sapientie naturalis multi etate nostra probant, imitantur et defendunt."

term, magic, should signify. It is the expression, "natural magic," to which he objects, rather than the particular beliefs and practices which others would include under that term. Similarly his opposition to occult virtues consists in large part of an unwillingness to call occult those virtues which others so designate. He might be thought to draw a sharper line between magic on the one hand and natural science on the other by his denial of any intervening borderland of natural magic, but he promptly shatters any such illusion by identifying experimental science with magic rather than with natural science. But let us pass on to his discussion of some specific forms of magical belief and practice.

Garcia denies the doctrine that the soul of man can recover and exercise its natural and innate power of divination by such practices as inspection of lucid surfaces or the effect produced upon it by drugs or music. He declares this belief based upon three wrong premises: first, that the soul has more power of innate science than it actually possesses; second, that its union to the body is not natural but violent and penal; third, that inspection of lucid surfaces and the other methods aid it to recover its power of seeing hidden things. He therefore condemns this theory and its practice as contrary to the catholic faith and natural philosophy, and as involving the assistance of demons.

Garcia does not dispute that astrology provides a natural method of predicting certain future events without any aid of evil spirits. He even grants, as Aquinas had, that the stars by their potent influence upon the human body may incline the will to certain courses of action, though he censures the vanity of contemporary astrologers who promise to predict with certainty in particular cases not only future events dependent on natural and necessary causes but those resulting from voluntary and free action.[44] He denies, however, the contention that just as philosophers and astrologers can learn much from the stars which

[44] *Ibid.*, fol. l.v, recto, "vanitas mathematicorum nostri temporis qui promittunt se posse predicere in speciali per certitudinem non solum futororum eventus qui a causis naturalibus et necessariis sed voluntariis et liberis

is unknown to the common people, so magicians and cabalists have a knowledge of occult virtues and the influences of the celestial bodies which transcends that of ordinary philosophers.[45] He further denies that certain men are born whose nativities especially fit them for divination or prophecy.

Next follows a long discussion whether astrological images are efficacious without demon aid. Garcia admits that Albertus Magnus was favorable to them in his treatise on minerals, and that Peter of Abano employed them and defended their use against theologians who said that they were diabolical.[46] A recent Spanish theologian had misinterpreted a passage in the *Contra Gentiles* giving an argument in favor of such images as Aquinas's own opinion, but Garcia clears Thomas of that imputation. His own long refutation of astronomical images sounds as if largely indebted to William of Auvergne. He further censures Albertus Magnus for speaking with compliance of the figures of the art of geomancy and of the images of Magoth Grecus and Germa of Babylon.

In this connection Garcia has to deal with a counter attack upon ecclesiastical magic by the defenders of such astronomical images and magic rings. They point to the wax lambs blessed by the pope which keep those who bear them from being struck by lightning, to the custom of blessing bells that they might fend off storms from the parish by their ringing, to the expelling of demons by exorcised salt and water, to the protection against thunderbolts afforded by wax blessed on the feast of the purification of the Virgin. They contend that their images and seals, which often are consecrated and fumigated in their fabrication, should be equally free from demons and work equally well, receiving virtue from the stars and celestial harmony. Garcia replies that the analogy is inexact, that the Christian observances are not by the virtue of the stars or power of words but are efficacious through the omnipotent virtue of the Creator. He also

dependent."

[45] *Ibid.*, fol. l.ii, verso.

[46] *Ibid.*, fol. l.vi, recto. Garcia cites Diff. 64, 113, and 10 of the *Conciliator.*

contends that Christian devotion does not seek the protection from storms, thunder, and demons from the holy water, bells, candles, or wax images but from the omnipotent Creator. But he leaves unanswered the natural question, Why then are the bells, water, salt, and wax images introduced at all? Why not go straight to the foot of the divine throne in prayer?

Turning to incantations, Garcia quotes a page and a half from the 156th *Differentia* of Peter of Abano's *Conciliator,* which on the whole affirmed their efficacy. But again he denies any analogy between sacramental words and words of the notory art or magic art. The Author of nature can give words a real causative virtue, but they do not possess it otherwise. Garcia repeats without acknowledgment William of Auvergne's argument[47] that words could not receive such power from the air, or from their sound, or from what they signify. He also denies that their virtue could come from the magician or the constellations. He agrees with Aquinas that substantial form is the root and foundation of every virtue and natural operation, but holds that the voice (*vox*) has no substantial form since it is a mere quality and accident. He admits that musical harmony of sounds affects human passions and cures diseases of the body, but this he classifies under number, not words and voices. Pico in defending his conclusion had argued that words and voices receive magic virtue in so far as they are formed by the voice of God. Garcia first of all denies that God has a voice.[48] Second, he finds no authority in scripture for God's giving words such magic virtue, "as we hold by faith that sacramental words by divine institution have the virtue and efficacy of producing sacramental grace in the soul."[49] Third, it is improbable that God would grant words power to work effects which are immoral or detrimental to divine majesty, as happens

[47] For it see *Magic and Experimental Science,* II, 352.

[48] See fol. m.viii, recto, "Tum primo quia ridiculum est asserere quod deus formet voces cum non habeat in se instrumenta formande vocis."

[49] *Idem,* "Secundo quia non constat nobis per rationem vel auctorem sacre scripture quod deus dederit vocibus et verbis magicis virtutem causandi illa mirifica opera que arte magica fiunt quemadmodum fide tenemus quod verba sacramentalia ex institutione divina virtutem et efficaciam habent causandi in anima gratiam sacramentalem."

in feats of magic. Fourth, to ascribe such words and voices to God would be to defend the notory art which especially employs them, but is condemned by the church. Therefore such words and voices must owe their efficacy to demons. Garcia carries this conclusion so far that he even ascribes the success of snake-charmers to the hidden assistance of demons.[50] In regard to the cure of lunatics and epileptics by repeating words of the Gospel over them, he agrees that such words, spoken with devotion and without any admixture of superstition, procure from God many benefits, physical and psychic, as too do prayers directed to God. But this is not true of incantations.

As for numbers, Garcia grants that they vary in perfection, as various church fathers had earlier stated. But he hastens to add that it is a fallacy to argue from their greater or less perfection that they possess more or less active influence. Much that has been written in praise of numbers should be taken mystically, not literally or as concerning the natural properties of numbers. He therefore denies numbers any magic potency.[51]

Finally we come to consideration of the cabala. Garcia denies the genuineness of its supposed great antiquity. Esdras, Paul, Origen, Hilary, and the Gospels have been quoted to show that the Jews had a secret oral tradition from God, but the third book of Esdras is apocryphal and the other passages do not refer to the cabala, of which Josephus and the church fathers say nothing. Even the Talmud was ordered burned by pope Innocent IV because of the heresies which it contained.[52] The Jews cannot

[50] *Ibid.*, fol. n, recto, "Per hunc modum ad prolationem quorundam verborum ligantur interdum serpentes a maleficis et aggregantur non quidem ipsorum virtute sed ministerio occulto demonum."

[51] His discussion of this point occurs at fol. n.ii, verso.

[52] *Ibid.*, fol. o.i, verso. Garcia in this connection cites the fourteenth century canonist, John Andrea, for the statement that the pope punishes the Jews for heresies against their own law. "Unde Joannes Andree doctor egregius in c. quod super his de voto dicit hec verba de talmuth. Papa punit iudeos cum contra legem suam hereses inveniunt et observant et hac ratione motus Gregorius papa et Innocentius quartus mandaverunt comburi librum quem iudei vocant talmuth in quo multe hereses continentur et puniri illos qui docerent illas hereses vel servarent." Similarly we are told that the inquisition burned some of the works of Maimonides: see *Magic and Experimental Science*, II, 206-207.

be convinced by arguments based on the cabala, nor are such arguments from the anagogic sense of holy scripture the most efficacious. The cabala is an invention of heretical Jews, derives from the Talmud rather than the Old Testament, is as false as most of the mystic expositions of the rabbis, and sometimes contradicts the proper anagogic and allegorical interpretation of the Bible. The conclusion of the whole matter is that theology is the sole science of faith, and consequently that magic and the cabala do not certify more as to Christ's divinity than theology. If they did give absolute assurance of Christ's divinity, faith would not be necessary, which it is heretical to assert.

That Garcia's work remained influential in the next century and that the house of Medici continued to be regarded as Pico's protectors after his death is seen from the fact that brother Archangelo de Burgo Nuovo addressed to Cosimo de' Medici, while he was yet duke of Florence (1537-1569), a defense of Pico against Garcia and an exposition of Pico's cabalistic conclusions. He eulogized Pico as "the most noble of the erudite and the most erudite of the nobility, the unique phoenix of his age," and as "more eloquent, illustrious, and holy than the ancient sages and more polished in every phase of life and learning."[53]

After the youthful indiscretion of his nine hundred theses,

[53] I have read the work in FL Plut. 54, cod. 16, 16th century, 254 fols: Fratris Archangeli Apologia pro Ioanne Pico Mirandulano contra Petrum Garziam episcopum Usselensem cum expositione conclusionum cabbalisticarum eiusdem Pici. Ad illustrissimum atque excellentissimum Cosmum Medicem florentinorum ducem. The text opens: "Antiquorum studium fuit Dei sacramenta et naturae semper obtegere et sibi Dei eloquia credita in corde suo abscondere ne peccarent." It was printed at Basel in 1600, "Apologia fratris Archangeli de Burgonovo . . . pro defensione doctrinae Cabalae contra rev. D. Petrum Garziam. . . . Mirandulam impugnantem . . . et conclusiones cabalisticae numero LXXI secundum opinionem propriam eiusdem Mirandulae ex ipsius Hebraeorum sapientum fundamentis christianam religionem maxime declarantes per eundem frat. Archangelum . . . declaratae et elucidatae"; and had been published before at Bologna, 1564, "Apologia pro illustrissimo D. Jo. Pico Mirandulae contra Rev. D. Petrum Garsiam episcopum Usselensem." Archangelo's exposition of Pico's theses on the cabala was printed at Venice in 1569. Garsia's arguments against natural magic were rehearsed by Pietro Passi, *Della magic' arte overo della magia naturale*, Venice, 1614, pp. 29-30.

Apologia, and flight to France, and Innocent VIII's persistent refusal to rehabilitate him, Pico became a sadder, if not wiser, man. He did not wholly abstain henceforth from public disputations, if we may accept as well authenticated the reports that in 1490 he disputed with the Dominican, Ludovico Valenza, then professor of Thomist theology at Padua and a year or two later with another Dominican, Thomas Cajetan de Vio, at Ferrara.[54] In the former disputation Valenza who had a remarkable memory answered Pico's many objections to his theses in perfect order and won the praise of his noted adversary. Pico's *De ente et uno,* of which he published the first part in 1491, led to a polemic with Antonio da Faenza in which the latter showed the superior comprehension of Platonic and Aristotelian doctrines.[55] Pico also was reported as occasionally disputing with Jews and as having converted one to Christianity. But Pico in a chastened mood devoted himself increasingly to works of devotion and asceticism,[56] the reformer Savonarola acquired an ascendancy over him, and his chief literary labor became the composition of an elaborate work against astrology. In this we find that he has completely altered the favorable attitude to magic of the nine hundred theses. He now belittles the supposed wisdom of the ancient Chaldeans and Egyptians and refers to his former attachment thereto as an aberration of his adolescence.[57] Now he even censures Albertus Magnus for venturing to suggest in the *Speculum astronomiae* that books of magic should not be utterly destroyed but preserved on the chance that they might sometime be of use to the church. This, Pico says, is contrary to the judgment

[54] Borsetti, *Historia almi Ferrariae gymnasii,* I (1735), 120-121, 130.

[55] Domenico Berti, "Intorno a Giovanni Pico della Mirandola cenni e documenti inediti," *Rivista contemporanea,* Turin, XVI (Jan.-Mch., 1859), 7-56, page 18.

[56] According to the *Vita* by his nephew Giovanni Francesco della Mirandola Pico scourged himself on Good Fridays and the like, and at the time of his early death was meditating devoting himself entirely to preaching or joining the Dominican order.

[57] *Disputationes in astrologiam,* XII, 2, "Neque vero non fallat quod me quoque adolescentem olim fallebat celebrata veteribus etiamque Platoni Aegyptiorum sapientia et Chaldaeorum." Bellantius, *Contra Picum,* liber primus, fol. q.ii, recto, in the edition of 1502, ascribed Pico's changed attitude towards astrology to Savonarola's influence.

of the church which orders their total destruction wherever found. For why preserve books which had better have never been written?[58] And whereas Pico had once held, nay more, stubbornly defended, the thesis that nothing so contributed to demonstrate Christ's divinity as magic and the cabala, now he asserts that magic is nothing else than a mixture of idolatry, astrology, and superstitious medicine, "which just as other superstitions we have confuted one by one in our books on the true faith against its seven foes."[59]

Pico did not change his mind all at once, however. During his trouble at Rome astrology had strongly tinged his correspondence with Ficino. When he arrived safely at Bologna, Ficino congratulated him upon escaping from the hands of his enemies. Ficino said that during the previous October while Mercury was being burned by Mars, martial persons had raged against Pico, but that he in the hour of Jupiter and Venus, relying on the patronage of Lorenzo the Magnificent, had checked the burning of Mercury.[60] Later, writing on May 30, 1488, Ficino consoled Pico further with the thoughts that the same constellations seldom prefigured both an undisturbed existence and a career of genius and glory, that jealous inferior demons harass those men who are dear to the superior demons, and that he and Pico were both born under Saturn, a planet which would ultimately prevail against the Martial demons.[61] Pico replied that "beyond all controversy the planet Saturn was harmful and unlucky," and that he was born under it to evil purpose.[62] Yet in his coming work against astrology he was to declaim indignantly against anyone who called the planets causes of evil.

In his *Heptaplus,* which appeared March 9, 1489, Pico also still maintained something of a cabalistic and astrological attitude. Indeed this work made a bad impression at Rome, as the

[58] *Disputationes in astrologiam,* Book I (p. 427 of the Basel, 1572, edition of Pico's *Opera*). The first book is undivided into chapters.

[59] *Ibid.,* XII, 6.

[60] *Epistolae Marsilii Ficini Florentini,* "Per Antonium Koberger impraesse Anno incarnate deitatis M.cccc.xcvii. xxiiii. februarii," fol. cxci, recto.

[61] *Ibid.,* fol. cxcii, r-v.

[62] *Ibid.,* fol. cxciii, recto.

pope informed Lanfredini.[63] The account of creation in *Genesis* is extolled as comprising all the secrets of nature,[64] and Pico revels in "revealing the mysteries of Moses,"[65] although all that he succeeds in deducing by this allegorical method are axioms, platitudes, and trite scientific hypotheses already well known without it. He accepts the existence of three parallel worlds, the angelic or intellectual or invisible, the celestial, and the sublunar or elemental. These three worlds were admirably prefigured by Moses in his construction of the tabernacle. The sublunar world is ruled by the celestial bodies and these by the angels. The world beneath the moon is corruptible, the heavens above it are incorruptible. The waters above the firmament are cherubic minds. That man is a microcosm is accepted unquestioningly.

> The rational soul is called heaven. For Aristotle calls the heaven an animal which moves itself, and our soul, as the Platonists prove, is a substance which moves itself. The heaven is circular and the soul also is circular. Nay more, as Plotinus writes, the sky is a circle because its soul is a circle. The heavens move in a circle; the rational soul, transferring itself from causes to effects and again recurring from effects to causes, is revolved in an orb of ratiocination.[66]

Very congenial to the art of astrology would seem these Neo-Platonic analogies. But Pico goes farther than that. He speaks of the planet Mars as sharp, violent, unlucky, Jupiter as beneficent and fortunate, the sun as sometimes good, sometimes bad.[67] He recognizes the efficacy of signs of the zodiac even when invisible to us.[68]

Even in 1491 in *De ente et uno* Pico still accepted the three worlds of the intellect, the heavenly bodies, and inferior matter. They all influence human nature, but the will remains free to model itself on whichever of them it chooses.[69] Massetani detected cabalistic elements in *De ente et uno* as well as the *Heptaplus*.[70] It was from such works as these, with no suggestion of any attack upon astrology, that Pico now turned to the very different attitude of his twelve books against astrology. These, as Berti put it, "certainly showed that he had given a better direction to his studies since the publication of the *Heptaplus*." Likewise the letters written during the last three years of his life are quite free from allegorical language or cabalistic doctrine.[71]

Soon after Pico's death the Carmelite, Baptista of Mantua, saw him in a dream and asked if amulets really benefited infants. Pico replied that sometimes there was some virtue in them, and that this pertained to natural magic, but that for the most part they were to be condemned as superstitious.[72] Thus Pico's friends seem to have thought of him as not having wholly abandoned the conception of natural magic. Yet this same Baptista in another letter congratulated Giovanni Francesco Pico on the publication of his uncle's attack upon astrology.

[63] Berti (1859), p. 39.
[64] See the preface to Lorenzo de' Medici.
[65] Prooemium to Book II.
[66] *Heptaplus*, IV, 1.
[67] *Ibid.*, II, 3.
[68] *Ibid.*, II, 5.
[69] Della Torre, *Storia dell' Accademia Platonica di Firenze* (1902), 756-764; Renaudet, *Préréforme et humanisme à Paris pendant les premières guerres d'Italie (1494-1517)*, (1916), 142-143.
[70] G. Massetani, *La filosofia cabbalistica di Giovanni Pico della Mirandola*, Empoli, 1897. Dorez, however, disagreed: see *Giornale storico d. lett. italiana*, XXXIII (1899), 397.
[71] Berti (1859), p. 42.
[72] Letter of January 3, 1495 in *Opera* of Giovanni Francesco Pico della Mirandola, 1506-1507, fol. f. iii recto.

CHAPTER LX

MAGIC IN DISPUTE, II

JACQUES LEFÈVRE D'ÉTAPLES, REUCHLIN, TRITHEMIUS

But just as Pico was abandoning such doctrines, the discussion of magic was again resumed at Paris and that in a very favoring way. This was done by one who was to exert much influence by his commentaries upon Aristotle, his editions of works in the field of mathematics, his biblical commentaries and translations, and who was to become prominent in the movements of humanism and the Christian Renaissance, Jacques Lefèvre d'Étaples. Writers on the Renaissance and Reformation have perhaps somewhat exaggerated his importance, whether as one who abandoned scholasticism for more fruitful scientific activity or who contributed to introduce the doctrine of justification by faith and to the cause of religious reform. As long ago as 1768 Daire called him "the light of France" who "seemed to have been given to save letters from the obscurities of sophists," to polish philosophy, re-establish the sciences, and succour mathematics.[1] His simplification of Aristotle for school-boy use may have had the negative merit of omitting much medieval learning, but made no advanced contribution to the history of Peripateticism or of modern philosophy. His editions of mathematical texts were largely of works written in or used during the middle ages such as Jordanus Nemorarius, Sacrobosco, Nicholas of Cusa, and Euclid. His Latin style was far from polished or classically correct and remained essentially scholastic, although he might cite classical poets, orators, moralists, and historians to illustrate the *Ethics* of Aristotle, or in 1496, in his introductory treatise to logic, speak of the Gothic blow which Latin

[1] Louis François Daire, *Tableau historique des sciences, des belles-lettres, et des arts de la province de Picardie jusqu'en 1752*, Paris, 1768, pp. 130-131.

letters suffered at the hands of scholasticism. As a member of the group at Meaux and court of Margaret of Navarre, his religious teaching was probably less akin to that of the Protestants than their historians have claimed. His translation of the Bible was too Catholic for the Huguenots to use. But whether deservedly to be placed in the front rank of humanists and liberal religious reformers or not, Lefèvre at least cast in his lot with that party rather than with the cause of past scholasticism. His work on natural magic, although it comes relatively early in his career, is therefore to be regarded as emanating from their camp, although its contents and attitude, like those of most of his works, are taken over from previous medieval writers.

Lefèvre was born at Étaples about 1455 and died in 1537. His early life is obscure and he published nothing until 1492, but his introduction to the first six books of Aristotle's *Metaphysics* was composed in 1490. In 1491 he was reading Ramon Lull on contemplation and thinking of retiring from the world into a monastery. Instead he went to Italy where he met Ermolao Barbaro and Pico della Mirandola, and was very likely inspired by the latter to undertake the work on natural magic. Its allusions to the infant dauphin, Orland, show, as Renaudet has pointed out, that it must have been composed between his birth on October 10, 1492, and death on December 16, 1494.[2] The treatise is addressed to Germain de Ganay, royal governor,[3] who was a brother of Jean de Ganay, who in 1488 was fourth president of Parlement and later became chancellor of Naples and of France. The treatise was never printed, and Renaudet suggests that the condemnation of Simon de Phares and of certain books in his library, of which we shall treat in another chapter, may have kept Lefèvre from printing his work.[4] Since Simon was

[2] A. Renaudet, *Préréforme et humanisme à Paris, 1494-1517*, 1916, p. 151.

[3] Vatic. Reg. Suev. 1115, fols. 1r-96r, Jacobi Fabri Stapulensis de magia naturali ad clarissimum virum Germanum ganaum regium gubernatorem libri sex.

[4] Renaudet (1916), pp. 152-153. That Lefèvre did not abandon his interest in the occult is suggested by later publications such as his scolia to the *Celestial Hierarchy* of Dionysius the Areopagite and commentaries on Hermes Trismegistus.

condemned by the Parlement, it at first sight seems odd that Lefèvre should have dedicated his work to a member of a family so closely connected with the Parlement. Germain de Ganay was *conseiller clerc* to the Parlement in 1485, canon of Notre Dame in 1486, dean of Beauvais before 1497, bishop designate of Cahors in 1509, of Orléans in 1512, and died in 1520. Besides being one of Lefèvre's chief protectors, he corresponded with Ficino and Trithemius.[5] Lefèvre also dedicated several of his works to Jean de Ganay. But in 1494 Jean was absent on the Italian expedition and in no position to prevent Simon's condemnation by his colleagues.

Lefèvre's treatise is preserved in at least two manuscript copies, one at Brussels and another at the Vatican in the collection formerly the property of Christine of Sweden. I have read it in the latter manuscript. The title indicates that the work consists of six books, but in the Vatican manuscript the text appears to be incomplete. At folio 90 verso we have reached the seventeenth chapter of the fourth book, but on the next leaf (fol. 91v) begins a chapter thirteen, while the text ends at folio 96 recto. Therefore most of the last two books appears to be missing. The manuscript is much stained, poorly written, and hard to read.

The opening chapter of the first book distinguishes natural magicians from others, and the second chapter advances what may be regarded as the basic proposition in natural magic, the mutual concord of things celestial and terrestrial, of which the one is agent, the other patient. The Chaldean *magi* regarded the heaven as a great animal, with Aries as its head, and so on. There then follow such astrological commonplaces as apportioning the twelve signs to the four elements, tables of pairs of planets, grouping of the seven planets with the signs, and the apportioning of parts of the human body to each. Fascination or attraction is exercised by various things upon one another, and different herbs are under each planet. To which planet they belong may often be inferred from their effects. Substances which

[5] Renaudet (1916), p. 150, note 4.

stupefy or cause death, such as opium, hemlock, antimony, the torpedo, the bone in a stag's heart, and mandragora, are known to be saturnine.

Lefèvre's second book deals with the contribution of the Pythagorean philosophy to magic, and especially the force and significance of numbers. The number three is effective in amatory incantations. The relation of celestial numbers to inferiors is also important and is associated with the diversity of souls new born. Composite numbers are discussed, and a chapter is devoted to the favorite magical doctrine that like attracts like. In what is described as "a theogony having a close affinity and concord to Christian theology," the Seraphim are associated with the ninth sphere, the Cherubim with the Aplanes or sphere of fixed stars, the Thrones with the sphere of Saturn, Principalities with Jupiter, Powers with Mars, Virtues with the sun, Dominions with Venus, Archangels with Mercury, and Angels with the moon. This reminds one of the similar association of spirits with the spheres by Michael Scot and Peter of Abano in previous centuries, though they gave Hebrew names for the spirits. It of course suggests the possibility of invoking spirits, though that is usually not classed as a part of natural magic. Later chapters deal successively with the symbols of the three superior numbers in divine things, with the symbols of numbers up to six in divine things, with what numbers are apt for the archana of magicians and diviners, with the efficacious and mirific addition and subtraction of divine things, with the sacrament of the blessed divine number. It is stated that every three hundred years man undergoes reformation and recuperation by the working of the divine bond and love. Chapter eighteen is about the quadruple seven, and that life is designated in three hundred, death in four hundred. The nineteenth and last chapter of the second book considers "numbers according to the arithmetic of the Syrians having importance for the preceding and many other mysteries." It seems evident that this second "Pythagorean" book is more concerned with the cabala than with natural magic.

The third book returns to more purely astrological theory

and proposes to join inferior images to celestial. Certain constellations preserve us from wild beasts. Arcturus is a genial star for fidelity and keeping faith. The celestial lyre makes men studious here below. Cassiopea is an unlucky star, urging on the female sex especially to forbidden arts. Pegasus gives the power of divining the future. Other stars and constellations are discussed in the same way.

The fourth book opens with an association of Greek and Roman gods with the signs of the zodiac: Aries and Pallas, Taurus and Venus, Gemini and Phoebus, Cancer and Mercury, Leo and Jupiter or Cybele, Virgo and Ceres, Libra and Vulcan, Scorpio and Mars, Sagittarius and Diana, Capricorn and Vesta, Aquarius and Juno, Pisces and Neptune. The author then digresses to discuss how the ancients discovered the twelve-fold division of the universe and the art of nativities. For twelve chapters he then deals with the twelve pairs above listed, after which he reverts to the subject of the third book and describes the astrological properties and influences of the constellation Lepus, the dog star, and Orion. The last, for example, is Martial and lunar, and excites clouds and tempests.

Then occurs the apparent break in the text to which we before alluded, followed by a chapter on "What the labor of Hercules in overcoming the hydra portends to us in magic." A few pages later the treatise terminates with the statement that priests and prophets and men most like God are under the constellation Ara, while men "of like sort and worse repute"—presumably evil diviners—are under the constellation Chiron.[6]

It is hard to see how Renaudet who had examined the *De magia naturali* of Lefèvre and gives some account of it, although rather briefer than ours, can write that "Lefèvre probably did not believe in astrology," even though he explains that, like Ficino, he admitted the influence of the planets, but "probably discarded the science of the casters of horoscopes."[7]

If Pico drew back from his earlier interest in the cabala, and

[6] Vatic. Reg. Suev. 1115, fol. 96r, ". . . Et hec de ara annotavit Manilius et eius esse sacerdotes ac prophetas et Deo homines simillimos quales et peius dicti sunt in Chirone."

[7] Renaudet (1916), pp. 153, 151.

Lefèvre did not feel encouraged to publish his volume on natural magic, there was at least one leading Greek and Hebrew scholar who maintained his cabalistic studies and did not hesitate to burst into print upon such a theme as the occult property of sacred names and words. This was John Reuchlin, the German humanist, whose *De verbo mirifico* was printed in 1494.[8]

The work is cast in dialogue form and, as in other specimens of the same literary form, each book represents one day's discourse. There are three books in all. The three interlocutors, Sidonius, Baruchias, and Capnio, all talk in much the same strain, and their utterances are about as difficult to distinguish as would be the barking of the three heads of Cerberus. All indulge freely in the same classical or Neoplatonic citation and quotation, all know their Euripides and Theognis, all are familiar with the Christian scriptures and church fathers, all are influenced by Philostratus's life of Apollonius of Tyana and the Orphic poems. Baruchias, though represented as a Hebrew philosopher, is even more given than the Greek Sidonius to grumbling against the schoolmen of that time who chatter all day like grackles with barbaric din, without ornaments of oratory or flowers of rhetoric, or who prefer the sophisms of Aristotelian dialectic to textual criticism of the holy scriptures, or gladly spend a lifetime on spider webs of logic and give how few years to divine literature.[9]

[8] Iohannes Reuchlin, Capnio dictus, *De verbo mirifico*, Basel, Ioh. Amerbach, 1494, Hain *13880. I have examined briefly this incunabulum at the British Museum (IB.37366, formerly 3834.bb. 1), but have used for the following citations in the notes the edition of 1514: Ioannis Reuchlin Phorcensis LL. doctoris liber de verbo mirifico. Tubingae ex aedibus Thomae Anshelmi Badensis Cal. Augusti Anno M.D.XIIII. Sub illustri principe Vdabrico Vuirtembergen. This edition will be cited by the signatures at the bottom of the leaves where these occur or by what they would have been, had all the leaves been so numbered. In the latter case the number will be put in parentheses. A peculiarity is that the leaves without signatures are not equal in number to those with signatures in the same quire. Thus from the fact that most of the signatures run up to b.iiii or i.iiii, one would judge that the quires were quaternions, but actually only two unnumbered leaves follow in each case. This is also true of the signature k which runs up to k.v.

Ludwig Geiger, *Johann Reuchlin: sein Leben und seine Werke*, Leipzig, 1871, has discussed the *De verbo mirifico* at pp. 179-184.

[9] These three passages occur in the edition of 1514 at fols. (A.vi.) verso, e.iiii,

It cannot be said that Reuchlin's own literary style always justifies his jibes against scholasticism. Much of his volume is exceedingly tedious. The diction sometimes sinks to a level like this: "You therefore to whom is that solicitude, that care, and who for miracle-making are avid, choose from this gathering, from this army, from this well-nigh legion of sacred names . . ."[10] On the other hand, a long list of antitheses concerning Jesus Christ,[11] while artificial and rhetorical, is rather cleverly ingenious and perhaps partly novel. "He wept, but he wiped away all our tears. He asked where Lazarus was, for he was human; but he raised Lazarus from the dead, for he was divine. He was sold for a trifling thirty pieces of silver; he redeemed the world at a great price. He was led like a sheep to the slaughter, but he reigns, that is, shepherds Israel and the whole world. Mute as a lamb, yet a voice crying in the wilderness. He is bruised and wounded, but he cures every infirmity and languor. He dies on the tree, but he gives a tree life and saves the thief. . . . He drinks the vinegar, but changed water to wine." And so on. Reuchlin's literary and textual criticism have not yet advanced to the point where he can realize the unauthenticity of the letter of Aristotle to Alexander on the Brahmans or of the sacred letters of the patriarch Jacob.[12]

Possibly we should assign the work some significance as an effort to give tolerant expression to the varying viewpoints of Greek, Jew, and Christian, as an approach to an exercise in comparative religion, and a step towards the more objective attitude of Bodin's *Heptaplomeron*. The readiness of Sidonius and Baruchias to transfer their adherence to the Christian faith rather spoils any such assumption, it is true. However, Sidonius does to some extent set forth past Greek philosophy; Baruchias,

recto, (f.v.) recto. I noticed only one similar utterance by Sidonius, fol. d. iiii, recto, "Nihil etiam quod tot et tam perplexas scholasticorum quaestiones vel intricare vel extricare profitemur."

[10] Fol. i.ii, recto, "Vos igitur quibus est ea solicitudo ea cura et qui miraculorum conficiendorum avidi estis eligite ex hoc conventu de hoc exercitu ex hac ferme nominum sacrorum legione quo sit potissimum in eiuscemodi operationibus utendum."

[11] Fol. i.iiii, recto-verso.

[12] Fols. f.ii, recto, and f.iiii, verso.

Hebrew lore; and Capnio, Christian doctrine. The fact that Sidonius is called an Epicurean, although he shows an almost equal interest in the wonders of the orient and rites of the Brahmans and Gymnosophists,[13] suggests the influence upon Reuchlin of Lorenzo Valla's *De voluptate* or *De summo bono,* a dialogue between an Epicurean, Stoic, and Christian. Nevertheless, when Baruchias exhorts Sidonius to be, like himself (and the emperor Hadrian), "a curious explorer of every sect,"[14] we feel that an effort at a wide comparative view is being made.

The main theme of Reuchlin's work is not natural magic, like Lefèvre's, but the power of words which surpasses all science.[15] The first book is largely devoted to belittling knowledge of material things and sense phenomena. Since the various ancient Greek philosophers could not agree as to the principles of things, let us rather pursue the eternal mind.[16] All nature below the moon is in a state of flux,[17] and constant, pure, and ineffable science cannot be attained by any human discipline but only by divine tradition, which we Hebrews, adds Baruchias, call the cabala.[18] Sidonius objects that Epicurus showed that the first knowledge of truth comes through the senses and that man cannot know the divine, but Baruchias inveighs hotly against Lucretius and Epicureanism.[19] What we think is science often is error, whether based on inferior natural causes or the aspects of the celestial bodies.[20] Even Sidonius grants that in sacred learning a different method must be followed from that of the mathematicians and physicists. For they think that contention and discussion between two parties or sides is the best method. "But in divine matters silence is necessary, contention is barred, syllogisms are ridiculed."[21] Thus the mathematical and experimental methods are scarcely recognized for science. Not that Reuchlin does not have a natural philosophy and theory of the

[13] See fols. (a.vi.) verso, c.iiii, verso.

[14] Fol. b.iii, recto.

[15] Liber I, ed. of 1514, fol. c.iiii, recto, "Ea enim sola vis est verborum que omnium scientiam superat."

[16] Fol. b.ii, recto.

[17] Fol. b.iii, recto.

[18] Fol. b. iiii, recto.

[19] Fol. b.iiii, recto-verso.

[20] Fol. (b.vi.) verso.

[21] Fol. c.iiii, recto.

universe of which he gives an occasional hint. Thus he speaks of the sky as linked with fire by their common matter, fire with air by their heat, air with water by moistness, water with earth by frigidity, and earth again with fire by dryness. Similarly God and lesser intelligences or demons possess in common immortality; demons and men share affection; men and beasts sense; while beasts and plants share the vegetative soul.[22]

Astrology and magic are even more severely criticized than physics and mathematics.[23] Sidonius has tried the magic books forged under the names of Enoch and Solomon and found them wanting. Robert and Bacon and Abano and Picatrix were equally unsatisfactory—an evidence that the magical treatises ascribed to Peter of Abano were already current before the close of the fifteenth century. Sidonius takes the same attitude in the second book. Robert of England indeed died wretchedly in Switzerland. This Robert is presumably the author of the work on ceremonial magic, and perhaps, as we have already seen in our chapter on Perscrutator, of the *Correctorium alchimiae* and of the treatise on weather prediction produced in 1325 at York. "And another whose name I suppress was more miserably captured and mulcted of his fame,"—perhaps an allusion to Pico della Mirandola's fate. Peril of life and death is about all that one gets from the pursuit of magic. Even if you make no pacts with evil demons and think to exercise magic quietly with the aid of good demons, you must master all the intricacies of astrology and many volumes. If a single factor in the entire procedure is wrong, the whole is a failure. Finally, after long vigils and toil, you are liable to be so frightened by other demons than the one whom you wish to conjure, that you will abandon the whole art at a loss of time and expense and become the laughing stock of others. As for astrology, Sidonius speaks of "the utterly incomprehensible power of the heavens" and the diversities of practice

[22] Fol. c, recto.

[23] Magic and astrology are discussed chiefly at the end of Book I and the beginning of Book II: in the 1514 edition between fols. (c.vi.) recto and d.ii, verso. But the story of the contest between the magician Cynops and the apostle John is not told until towards the close of Book III.

and disagreement between different astrological authors. Wearied by their unsuccessful efforts to satisfy by such means the popular demand for wonders made upon them as philosophers, Sidonius and Baruchias both hail with delight Capnio's promise to reveal to them a single word by which they may control nature and work prodigies, portents, and miracles.[24]

Before, however, Capnio makes good his promise in the third book, Baruchias enters in the second book on a discussion of secret names and the occult virtue of words in Hebrew.[25] The gist of the argument is that certain words are superior to others and when properly pronounced lead God to make a covenant with man, if the man is pious and of pure life. Such words, however, as Capnio has already explained,[26] do not derive their virtue from us. He does not claim, as some do, to coerce the gods by words and characters. Their power all derives from God working through us. Divine omnipotence alone creates miracles. Nevertheless the words themselves are of importance. The reason why barbarous words are preferred in wonder-working and incantations is held to be that their primitive character takes them back to the ancient and original Hebrew language. As there are no writings older than the Mosaic and the lore of the Egyptian priests is of much more recent date, so words in Hebrew are superior in occult virtue to those of other languages. If another people performs miracles by using words of its own language, either this is evil magic wrought by aid of demons rather than God, or else the words will be found to have been taken over from the ancient Hebrew. A certain noble philosopher at Rome, by whom Pico della Mirandola is probably meant, had recently held that no names in magic and licit operations have equal virtue with the Hebrew or words thence derived.[27] It is noteworthy that the evangelists and apostles did not translate into Greek the words with which Christ effected his miracles.

[24] Fol. c.ii, verso, "Simulque in natura constituti supra naturam dominamur et monstra portenta miracula divinitatis insignia nos mortales uno verbo quod iam pridem vobis explicare ausus sum prodigimus."

[25] It extends from fol. d.iiii, verso, to (e.v.) recto.

[26] Fol. d.iii, recto. See also fol. i.ii, verso.

[27] Fol. e.iii.r-v.

Nevertheless it is granted that a person's own name or that of a city is very useful in incantations, and that the ancient Romans always made a point of learning the secret names of places they were attacking. After Capnio has briefly interrupted Baruchias to cite Origen against Celsus and Iamblichus' reply to Porphyry on the subject,[28] Baruchias goes on to set forth the Hebrew secret names for God—Ehieh or On, Hu or Tauton, and Esth—concluding with the great Tetragrammaton. With it he associates the Pythagorean Tetractyn and a long list of various quaternities, more elaborate even than that of Raoul Glaber. Much is also made of the numerical value of each of the four letters composing the Tetragrammaton.

In the third book, along with much religious discussion of the logos and Trinity, Capnio continues in the same strain, asserting that the translators could find no word equal to the Tetragrammaton in other languages,[29] and that as nature acts naturally by sensible qualities, so God acts supernaturally through intellectual names.[30] Aben, meaning stone, is composed of the two words Ab and Ben, signifying respectively father and son, while the component letters of the word Bra in *Genesis* suggest father,[31] son, and spirit. But the Tetragrammaton has now been surpassed by the name of Jesus which has inserted the consonant S amid its four vowels, changing IHVH to IHSVH—S, a letter of wonderful mystic significance and numerical associations. Even the sign of the cross which is used in magic among non-Christian peoples is of no great efficacy without the name of Jesus.[32] It is the philosophers' stone, far surpassing that over which the alchemists contend.[33] That name all natural and magical powers obey and it is vastly superior to all magic.[34]

This last point is then illustrated by the story of the conflict between John and Cynops. When the apostle John wrought too many miracles in Patmos through the name of Jesus, the priests

[28] Fol. (e.v.) recto.
[29] Fol. h.i., verso.
[30] Fol. i.iii, verso.
[31] Fol. h.iiii, recto.
[32] Fol. (k.vii.) recto.
[33] Fol. (k.vi.) recto.
[34] Fol. k. iii, recto-verso.

of Apollo called on Cynops, prince of magicians, to help them. He sent a demon to kill John, but the latter, after questioning this evil spirit, held it bound in one place. Cynops sent a second demon with the same result. He then sent two, one of whom observed the other's fate and reported it to Cynops. Cynops infuriated then left his desert abode and came to town with his whole cohort of demons. Questioning a youth at random from among the spectators and learning that his father, a sailor, had drowned at sea, Cynops asked John to restore him to life. When John refused, Cynops with a great noise disappeared in the waves and soon emerged again with the lad's lost parent. He also produced both the murdered son of another citizen and his murderer. But the next time the magician entered the sea John prayed that he might not reappear and also that the three demons who had personified the two dead men and the murderer might vanish. The prayer was answered, although the people waited three days and nights for Cynops' return until they were utterly exhausted. Three youths died, but John resuscitated them, and the people were baptized as a result of his preaching.[35]

It should not be inferred that marvelous power is entirely confined to words in general and the name of Jesus in particular. Numbers come in for their share of attention even more than has been already suggested. Seven ages of world history are set forth,[36] and it is explained that the Psalms are not arranged in chronological order but numbered on mystic principles.[37] Occult virtues in nature are accepted, and such specific instances of them are given as the suspension of an emerald about the neck to prevent epilepsy or of coral to check a stomachache.[38] Physiognomy receives recognition when Capnio, after describing that of Baruchias, states that Saturn, "author of arcane contemplation," is said to produce such features.[39] Astrology is not entirely rejected, for it is granted that signs of the stars and weather

[35] *De verbo mirifico*, Liber III; in edition of 1514, fols. k.v. recto-(k.vi.) recto.
[36] Fol. (i.vi.) verso.
[37] Fols. e.iiii, verso; g.ii, verso. See the previous chapter for a like statement by Pico della Mirandola.
[38] Fol. (f.vi.) recto. See also fol. (d.v.) recto.
[39] Fol. (b.v.) recto-verso.

signs are not used in vain,[40] and that man is a microcosm.[41] Capnio even states that all the art of miracles divides into three parts, physical, astrological, and magical, and that no one of the three can work without the others.[42] Thus despite its professions of Christian orthodoxy, the attitude of the work is favorable to occult sciences and particularly to the cabala and to the virtue of words and numbers. Reuchlin was to treat of the subject again after 1500 in his *De arte cabbalistica*, printed in 1517.

To treat completely the attitude towards magic of Trithemius (1462-1516) and the books of magic and experiments which were attributed to him in editions printed or manuscripts written long after his death, would take us far beyond the time limit of the present volume. His work against witches was not written until 1508. On the other hand, he professed himself a defender and adherent of natural magic,[43] and we may briefly illustrate his attitude by a letter which he wrote in 1499 to Arnoldus Bostius, a canon of Ghent who had inquired what books he was writing and with what studies he was occupying himself. The death of Bostius prevented the letter from reaching him. Instead it was published and, says Trithemius,[44] brought him under suspicion of being either a boastful liar or one having commerce with demons. This was because he said in the letter that he had under way a great work, entitled *Steganographia,* at which all the world would marvel should it ever be published, *quod absit.* There would be four books, each of at least a hundred chapters, full of the most stupendous and incredible and unheard of matters.

[40] Fol. i.iii, recto.
[41] Fol. (d.v.) recto.
[42] Fol. d.ii, verso.
[43] In letters to John Westenburgh and Joachim, margrave of Brandenburg, reported by Heidel in the *Vita Joannis Trithemii abbatis* prefixed to his edition of the *Steganographia*, 1721. But as they appear to have been written after 1500, they will not be detailed here. See, however, *Magic and Experimental Science,* II, 550. Trithemius's exposition of Peter of Abano's astrological interpretation of history was addressed to the emperor Maximilian in 1508: *De septem secundadeis id est intelligentiis sive spiritibus orbes post deum moventibus,* 1600, is the edition I have seen.
[44] I follow the reproduction of Trithemius's account of his letter in J. J. Boissard, *De divinatione et magicis praestigiis,* 1616, page 49.

The first book would contain over a hundred kinds of secret writing. The second book would set forth a method of communicating one's thoughts by fire to a distance of a hundred miles or more without words, writing, or signs, and secretly, and even to one in a deep dungeon or a remote and secret place. This without superstition or aid of spirits. The third book would teach a method by which a rude and uneducated person could learn Latin, Greek, or any other language so exactly that he could easily be understood by the learned.

The fourth book will contain many stupendous things, yet purely natural: that I may express my thought to another while eating, sitting, or walking, without words, signs, or nods; and many other things which are not to be divulged publicly.

Trithemius protests that he is not a magician, that he employs no superstitious observances or invocation of spirits. He points out that Albertus Magnus, that most profound scrutinizer of nature, gained a popular reputation as a magician because of the marvels he wrought by occult virtue of nature. Trithemius, however, professes to have his secret knowledge "not from man, nor through man, but by revelation." While he was resting on his couch and thinking, someone stood by him and said, "O Trithemius, what you have been thinking are no idle thoughts." This unknown visitor then instructed Trithemius further. "Moreover," concludes Trithemius, "I can learn all those things in any language of the world, though I have never heard it before." Such mystic science and bizarre pretensions, based partly on the lore of the past, partly upon personal vanity and disordered genius, such dim and occult adumbrations of modern practical inventions, such secrecy of method, point forward from the close of the fifteenth century to the age of Henry Cornelius Agrippa, Giambattista della Porta, and Jerome Cardan.

Two anonymous disputations whether astrological divination is heretical, illicit, or superstitious, have as much or more to do with demons, divination, and magic as with astrology and may therefore be appended to our chapters on Magic in Dispute be-

fore we turn to Astrology at Bay. They are preserved in a manuscript at Munich which the catalogue dates as of the sixteenth century, although it is written in double columns in a medieval hand and spelling that suggest the fifteenth century rather.[45] At any rate the content smacks of that period, since the articles of the faculty of theology at Paris against magic arts of 1398 are cited[46] and furthermore Gerson's censure of the physician who employed an image to restore health.[47] On the other hand, an allusion to the invention of printing shows that our text dates after the middle of the fifteenth century. This allusion occurs in the first disputation which, arguing whether diviners and observers of natural days are to be classed as heretics, notes in their favor that they are honored at the courts of princes and that the publication, printing, and sale of their books is permitted. The anonymous author holds that man's will is free although it may be inclined by the stars, and that, just as it is Catholic to assert that many effects happen contingently, so it is heretical to believe that these can be certainly divined by the stars, auspices, or dreams. He declares against lots of the saints (*sortes sanctorum*), distinguishes between various forms of divination in Isidorian fashion, and discusses supplementary queries such as whether a skilled astrologer can read in the sky determined significations for pope or Turk, and whether astrologers can know the fate of Christianity, Judaism, and Islam. The answer to the latter question is that they can do so in the case of Mohammedanism, but not of Christianity and the Mosaic law, since these are of divine institution. But if something happens in these religions in a natural way, then it comes under astrology. The further question is asked whether demons can be coerced by astrological characters, rings, and images. The answer is that they only pretend to be coerced, and the articles of the faculty of theology are cited against such images. A priest who has bap-

[45] CLM 602, fols. 1r-13v, col. 1, "Utrum mathematici et dierum naturalium observatores sint heretici censendi"; fols. 14r-25r, col. 2, "Utrum divinatio de futuris per astra sit [il]licita et superstitiosa."

[46] At fol. 12v, are cited articles 17 and 21.

[47] *Ibid.*, fol. 13r.

tized or blessed such images, if he did so without placing faith in them and for a benevolent end, should promise not so to offend again and suffer suspension for a year from his ecclesiastical office.

In the second disputation it is argued that astrology involves no pact with demons and so is licit, but Augustine is cited to the contrary. It is held that demons can deceive man by miracles, true prophecies, and other good works, that the malice of the demons sharpens their wits, and that, although no one can rationally deny the working of the stars on inferiors, yet it is madness to judge by them concerning man's liberty of action, fortune, and end. Even famine, pestilence, and sterility are to be ascribed more to the elements and mixed bodies and first and second qualities than to the sky, so that to judge certainly as to them from the stars is fatuous and presumptuous, while to predict casual or fortuitous future events by the stars is illicit and superstitious. Some strong arguments are advanced, however, against the conclusion that the malice of the demons serves to increase their knowledge. It is contended that the intellect should decline along with corruption of the will and depraved appetite, and that malice and ignorance go together. It is also contended that demons and false prophets ought never to speak the truth. But we cannot take the space to detail all the arguments and counter arguments. Those knotty problems, the apparition of Samuel and the divination of Joseph, are discussed, and our author admits the existence of a natural magic which makes no use of demons.[48] Many supplementary queries are entertained; whether one should be quick or slow to believe revelation, whether revelations now are more open to suspicion than in the primitive church, whether Abraham should have been so ready to slay his son Isaac, what requirements should be applied in examining a revelation, whether the disciples sinned in thinking Christ a phantasm when He walked on the sea, whether it is lawful to employ incantations and ligatures such as Apollo and Esculapius, the first inventors of medicine, used, or in which

[48] CLM 602, fol. 19v, col. 2.

the name of Jesus is invoked. Demons surpass human physicians in the practice of medicine because of their keenness of intellect and their ability to fill prescriptions at short notice, bringing drugs from the ends of the world in the twinkling of an eye. It is then asked if the Waldenses are borne to various places by the aid of demons. Yet other queries as to demons bring out further the tendency of our treatise to stray from the theme of astrology to that of evil spirits and magic. A concluding set of questions brings us back to the original subject. Egyptian days, chiromancy, and *ars notoria* are pronounced unlawful. It is denied that by images consecrated under certain constellations one can know whether the person in whose name the image was consecrated or baptized will die or recover, that Friday is different from other days of the week, that Christianity owes its durability to the constellation under which it was founded, that the time of the coming of antichrist can be found by the astrolabe, or that men could be reproduced after a flood by the prevailing constellation without sexual intercourse.

CHAPTER LXI

ASTROLOGY AT BAY, I
PICO DELLA MIRANDOLA

The closing decade of the fifteenth century was marked by two events of considerable importance in the history of astrology or of opposition thereto, for they were both directed against astrology. The most outstanding theoretical and literary attack upon the art since the treatises of Oresme and Henry of Hesse in the fourteenth century was now launched in Italy by Pico della Mirandola who composed twelve books of disputations against astrology. Almost simultaneous was the legal condemnation in France of Simon or Symon de Phares and certain astrological works in his library. This was perhaps the most noteworthy case of the sort since the condemnation in 1327 of Cecco d'Ascoli. We now shall consider in turn these two assaults upon astrology in the waning fifteenth century; the one, an appeal to reason, the other, a resort to force, but both not without a theological or ecclesiastical motive force back of them.[1]

Pico devotes the first of his twelve books against astrology to the attempt to show that it has been condemned of old by all good judges and critical minds,—Caesars, prophets, pontiffs, saints, philosophers, and mathematicians. This effort to give the impression that most of the great minds of the past have condemned astrology is weak and unconvincing to anyone at all acquainted with the past history of that subject. Pico selects only those persons and data that support his contention, suppressing the evidence to the contrary, or misrepresents the attitude of other personages. For instance, he likes to think of Albertus

[1] I may mention the paper of Hans Baron, "Willensfreiheit und Astrologie bei Marsilio Ficino und Pico della Mirandola," in *Kultur- und Universalgeschichte Walter Goetz zu seinem 60. Geburtstage dargebracht,* Leipzig, 1927, pp. 145-170, but I disagree with much of it.

Magnus as having (like himself, though he does not give words to this thought) studied astrology and magic only in his youth and abandoned them in his later years.[2] But the fact is that Albert probably wrote the *Speculum astronomiae* in 1277 only three years before his death. If Pico's object in this opening book were merely to show a certain amount of precedent for his own attack on astrology, his purpose would have been achieved. Otherwise we must regard it as a hasty, superficial, rhetorical, and inadequate performance. His brief citation of the Code of Justinian, for example, is a quite insufficient picture of the attitude of the Roman emperors and law to astrology. On the whole, his citations are about as unconvincing as those of the astrologers in favor of their art. He had a wide, if not exhaustive, acquaintance with the past literature germane to his theme, but the use he makes of it is that of the advocate and dialectical disputant, almost at times that of invective, rather than that of the impartial historian of ideas. This attitude continues true in the citations in the remaining books. Thus Pico knew well enough that Regiomontanus, whom he calls "sublime and the most learned mathematician of our age," practiced astrology. Indeed, he cites him on such matters as aspects and the division into houses.[3] But he tries to use his statements against astrology instead of facing the fact. His attempt to quote Paolo Toscanelli against astrology also strikes the reader as rather disingenuous. He takes from his contemporary, Nicolaus Leonicenus, the explanation of the practice of astrology by learned men that they use it as a trick to obtain money for astronomical research from princes who would otherwise not give a penny for it.[4] This is perhaps the first occurrence of this

[2] This particular example occurs, however, not in the first book of *Disputationes adversus astrologiam,* but in book XII, chapter 7, at the close of the work. Since there are various editions, differing greatly in pagination, I cite by book and chapter. The *Disputationes* were first printed after Pico's death by Benedictus Hectoris at Bologna, July 16, 1496, rather than 1495: see *Catalogue of Books Printed in the XVth Century Now in the British Museum,* VI (1930), 843.

[3] *Disputationes adversus astrologiam,* VII, 9; IX, 7.

[4] *Ibid.,* Bk. I, p. 418 in *Opera,* Basel, 1572: for Toscanelli see also IX, 6 and 11. Bellantius, *Contra Picum,* liber primus, affirmed the devotion to astrology of Toscanelli and others.

excuse which has often been repeated since by modern apologists for the astrological activities of Kepler and others. Somehow it sounds a little too much like an alibi and afterthought. Or possibly much of the "astronomical research" in which the learned engaged by preference would be found on closer examination to be only a shade less superstitious than the "practice of astrology" which they executed for pay.

In this first book Pico evinces a certain degree of critical acumen. He reproves Albumasar for confusing Ptolemy the astronomer with the Ptolemies who ruled Egypt. He rejects as spurious the *Secret of Secrets* supposed to have been written by Aristotle to Alexander and the *De proprietatibus elementorum,* with its doctrine of astrological conjunctions, which Albertus Magnus had accepted as Aristotle's. Pierre d'Ailly had preceded Pico in denying that *De vacca* was by Plato or *De vetula* by Ovid or that Hippocrates wrote the work on astrological medicine then ascribed to him. Pico also rejected Roger Bacon's citations of Artephius and Ethicus. But when he contends that certain superstitious books of astrology are by Roger Bacon and Robert of York[5] rather than by Albertus Magnus, he probably goes too far, although he does not state specifically what are the works to which he alludes. It has since been assumed that he meant to ascribe the *Speculum astronomiae* to Roger Bacon, in which case he was certainly mistaken; all the evidence goes to show that it is correctly ascribed to Albert. Pico also still attributed to Ptolemy the spurious *Centiloquium.*[6]

After the first book it is difficult to discern any logical arrangement or orderly sequence in Pico's work and argument. Little reason is apparent either for the way in which the books and chapters succeed one another or for the chopping up of the text into these. Pico seems to have written as things occurred

[5] Pico does not call him Robert but simply "Eboracensis," whereas Reuchlin, as we have seen, alluded to superstitious writings of a Robert, or Robert of England, without mention of York.

[6] *Disputationes adversus astrologiam,* III, 14.

to him and not to have minded if he touched on a topic again in a later book or chapter. The work is rambling and ineffective so far as orderly presentation and cumulative argument are concerned. It should be added in excuse that Pico had not really completed the work at the time of his death, and that it required considerable editing at the hands of his nephew before it could be printed.[7]

In his second book of ten chapters Pico points out that the uncertainty of astrological prediction has been admitted even by its leading representatives. He contends that elections are useless, that astrology is not useful in deciding what to do or to avoid—a short and weak chapter—and that Roger Bacon and Pierre d'Ailly erred in representing it as of use in religion, since it is rather injurious to Christianity. He then stresses the conflicting opinions of astrologers and the ignorance and carelessness of those of his time. He shows by foreign and domestic examples that their predictions seldom come true and explains why they do sometimes.

In the third book of twenty-seven chapters Pico turns from the predictions of astrologers to the nature of the influence of the stars. He would limit it to their motion and light, denying them any occult influence, and make the heavens a universal cause[8] but not relate their configurations to individual divergences. He grants that nothing in the physical world is done without the influence of the heavens, but particular events are conditioned by secondary causes.[9] He denies that the planets either in themselves or their influence are cold, dry, or moist, as they are represented in astrology. Nor can particular effects

[7] *Ioannis Francisci Pici Mirandulae domini et Concordiae comitis Epistolarum libri quatuor*, printed with other works of his at Strasburg, 1506, 1507: letter of March 1, 1496 to the duke of Milan, Lib. II, fol. D recto, "multaque opera a nobis in unum ex litturato et multas in partes discerpto exemplari redactae que proxime foras exibunt."

[8] This point he repeats more than once later; see III, 25.

[9] *Disputationes adversus astrologiam*, III, 4: "Ita patet in corporeo mundo nihil quidem fieri sine coelo veruntamen quod hoc aut illud fiat id a coelo non esse sed a secundis causis cum quibus omnibus coelum talia facit qualia ipsae facere natae sunt sive illis ad speciem sive ad individuum causae pertineant."

be inferred from their movements. Sir Isaac Newton, however, would hardly have agreed with Pico's assertion that a stone will not fall or fire rise any faster or slower, no matter how the stars are moving. In light and heat the sun so far exceeds all the other planets that they would seem to exert little influence on inferiors through this channel.[10] Pico, however, will not deny that there is some influence from all the stars[11] but he denies that each has a force of its own apart from its motion and light. He also denies that stars on the other side of the earth whose light does not reach us can influence us. He holds that there is no natural basis for the signs of the zodiac, astrological houses, and other artificial divisions. It is rather amusing that he should question any connection between the rising of certain constellations and weather changes, yet accept as probably learned by experience the belief of sailors that February 6, 12, 15, 17, 19, 20; March 1, 7, 15, 17, 19, 25; April 5, 6, 12, 20, were risky days to sail on.[12] He also accepts the notion that gems and animals in the orient possess greater virtue but holds that the heat of the sun alone will account for this without resort to other planets and constellations. He further believes that southerners who breathe warmer air are colder inside and hence timid and effeminate and, as daily experience shows, born only to servitude. The immoderate heat so relaxes their bodies that it takes away most of their internal heat or drives it to the extremities of the body, producing blackness of the skin and leaving fear in the heart. Thus there does not seem to be much to choose between Pico's science and the astrological reasoning which he rejects. Somewhat analogous is his attitude in rejecting what Ptolemy ascribed to the moon's phases but accepting the moistening effect attributed to the moon by farmers and

[10] *Ibid.*, III, 10: "Si igitur totam naturam circumspicias, nullum videbis ab ea indicium dari foveri a se res inferiores alio calore quam solis. . . ." This is an argument to which he frequently returns; thus (III, 20) he states that the days of summer are always hotter than those of winter no matter how much influence Saturn may be exerting.

[11] *Ibid.*, III, 11, "Verum demus astrologis et nobis quoque non id magnopere pernegantibus defluere a stellis omnibus aliquid."

[12] *Ibid.*, III, 13.

Hesiod.[13] Indeed, Pico is interested to magnify the moistening effect of the moon, which he holds increases as it waxes and decreases as it wanes, just as he was concerned to stress the heat of the sun, in order to minimize any dry and wet, as well as hot and cold, influences from the other planets.[14] Or he grants that humors vary with the moon[15] but questions its influence on tides,[16] as well as on critical days.[17] Or, while maintaining that he disapproves of superstitious observance of numbers, he holds that the seventh day or month or year is naturally significant not because of the constellations but some occult property or condition of things.[18] Thus to take refuge from astrology in occult virtue seems no great advance towards rationalism. But while Pico concedes occult virtues in inferior objects, he rather inconsistently denies them to the heavenly bodies.[19]

Besides denying the specific astrological doctrine that the child born in its eighth month dies because of the influence of Saturn,[20] Pico brings three more sweeping charges against astrology in the course of the later chapters of his third book. The first is that the rules of the art are groundless fabrications.[21] The second is that the stars are not the cause of evil which inheres rather in the four inferior elements.[22] The third is that the physical influences of the planets may not be extended to human character and mentality, or to external dignities and fortune.[23]

In his fourth book Pico goes on to argue that chance events are not ruled by the sky, yet are those concerning which astrologers are most consulted.[24] He recognizes that astrologers may deny that there are any chance events, holding that all events are

[13] *Disputationes adversus astrologiam*, III, 14.
[14] *Ibid.*, III, 26.
[15] Later, however (III, 17), he contends that the relative velocities of the other planets are not in accord with the periods of the humors and also criticizes the attempt to refer all such periods to the moon alone.
[16] *Ibid.*, III, 14-15.
[17] *Ibid.*, III, 16.
[18] *Idem.*
[19] *Ibid.*, III, 24.
[20] *Disputationes adversus astrologiam*, III, 18.
[21] *Ibid.*, III, 19, ". . . ficta ab eo in coelo dispositio per vanissimas regulas et commentitias non natura sed arbitrio constans astrologorum."
[22] *Ibid.*, III, 21.
[23] *Ibid.*, III, 22-23.
[24] *Ibid.*, IV, 2.

caused and ruled by law.[25] But he regards as fortuitous what happens beyond the intent of the operator or from the chance concourse of several causes. Pico prefers to ascribe such events to act of God and the angels, but his reasoning is not very convincing. Thus he asserts that if a person who had no reason for going out yielded to a sudden impulse and left the house just before it fell in ruins, his escape should be ascribed to direct act of God rather than to the influence of a benevolent planet. He further declares that the stars are intermediaries only between God and earth, while the angels are intermediaries between God and man.[26]

Pico denies that the fate of other and perhaps older persons can be predicted from the child's geniture. For example, from an individual's horoscope one cannot determine concerning the fate of his parents or brothers.[27] Nor from a present constellation can one forecast the distant future.[28] He again attacks elections,[29] again criticizes the astrologers for subjecting mind and morals to the stars,[30] and denies that even other religions than Christianity are controlled by the constellations.[31] Indeed he has now reached the point where he questions if physical defects and peculiarities are so governed.[32] Most of Pico's argument thus far has been against regarding the stars as causes. He now also opposes considering them as God's signs. He objects to making God the direct cause of multitudinous events,[33] although in a previous chapter he had been ready to ascribe various fortuitous events to Him, such as impelling a man to dig where treasure lay buried. Pico next assails the astrological practice of interrogations,[34] and the presumption of subjecting divine miracles such as Noah's flood or the star of Bethlehem to the stars.[35] Miracles for Pico lie outside the order of natural causation and are signified by other miraculous occurrences as natural phe-

[25] *Disputationes adversus astrologiam*, IV, 3.
[26] *Ibid.*, IV, 4.
[27] *Ibid.*, IV, 5.
[28] *Ibid.*, IV, 6.
[29] *Ibid.*, IV, 7.
[30] *Ibid.*, IV, 8-9.
[31] *Ibid.*, IV, 10.
[32] *Ibid.*, IV, 11.
[33] *Ibid.*, IV, 12.
[34] *Ibid.*, IV, 13.
[35] *Ibid.*, IV, 14-16.

nomena are by natural indications. He also warns against quoting biblical passages in support of elections.[36]

The fifth book is devoted to the theory of conjunctions. The same arguments as Henry of Hesse had already employed against them are used again, but Pico further criticizes the later work of Pierre d'Ailly on the concord of history and astrology,[37] and opines shrewdly that astrology is more dependent on history than history on astrology.[38] The chronology of d'Ailly and other astrologers as to the date of creation, the deluge, and so forth is condemned,[39] and Abraham Judaeus is censured for his conjunction for Moses and prophecy of the Messiah.[40] It is held that the birth of Christ cannot be related to any great conjunction,[41] and that His geniture, if correctly calculated, does not correspond to either His career or death.[42]

The sixth book has rather less unity of subject and treatment. Pico begins it by contending that the astrologers cannot agree among themselves as to the rudiments of their art such as the beginning of the year or what constitutes exaltation or elevation. He then assails the theory of the *magnus annus,* according to which the planets and signs would all eventually return to exactly their original places and history would then begin to repeat itself. Some astrologers whisper in their followers' ears that the resurrection of the Christians, Jews, and Moslems will be only this, and that the prophets of these religions were really astronomers who concealed these mysteries from the populace. Pico believes that Haly in his commentary on Ptolemy and Oresme in his treatise on the proportion of proportions have already sufficiently demolished this doctrine of the *magnus annus.*[43]

Pico argues that the planets should exert a constant influence and not vary with their relative positions.[44] From this he proceeds to attack the division of the sky into signs and houses[45] and

[36] *Disputationes adversus astrologiam,* IV, 15.
[37] *Ibid.,* V, 7.
[38] *Ibid.,* V, 8.
[39] *Ibid.,* V, 10-11.
[40] *Ibid.,* V, 12.
[41] *Ibid.,* V, 13. Hastings' Bible Dictionary does not agree with Pico on this point.
[42] *Ibid.,* V, 14.
[43] *Ibid.,* VI, 1.
[44] *Ibid.,* VI, 2.
[45] *Ibid.,* VI, 3-4.

the astrological doctrine of aspects.[46] He objects to the conception of *obsessio,* applied to a planet surrounded on both sides by rays of evil stars,[47] to the dictum that planets which come under the sun's rays are badly affected or "burnt up,"[48] and to the theory that planets exert more force when retrograde than when direct.[49] In short, Pico would have the influence of the planets increase with propinquity to one another or to the earth and decrease with distance, and not vary according to arbitrary mathematical divisions or relationships. There is no natural force in the head and tail of the dragon which are mere intersections of imaginary circles and which the ancients did not use in predicting.[50] Nor did Ptolemy employ *antiscia,* an error in which Maternus and Haly aberrated.[51] *Trigoni* and the sex of signs, *facies* and *termini,* are other astrological terms and measurements which Pico rejects.[52] He concludes the sixth book by condemning climacteric years.[53]

The central thought of the seventh book in ten chapters seems to be a criticism of the time element in astrological predictions. The old dilemma of the instant of birth or conception is raised. Pico can see no sense in forecasting the future history of a city from the date when its first stone was laid; he would prefer the time when it began to be inhabited or its government first functioned. He points out that astrologers disagree as to the signs and planets which govern different regions of the world. Again the divergence of opinion as to when the year begins is made a difficulty. The method of directions to define the times of future events is also criticized. For example, if at the time of birth the horoscope is in the fifteenth degree of Leo, while Saturn is twenty-one degrees distant in the sixth degree of Virgo, the inference is drawn that Saturn will exert an evil influence on the person in his twenty-first year.[54] Finally, the astrologers are censured for taking only one thousand and twenty-two stars into

[46] *Disputationes adversus astrologiam,* VI, 5-7.
[47] *Ibid.,* VI, 8.
[48] *Ibid.,* VI, 9.
[49] *Ibid.,* VI, 10.
[50] *Ibid.,* VI, 11.
[51] *Ibid.,* VI, 12. We heard George of Trebizond advocate the *antiscia,* despite his attachment to Ptolemy.
[52] *Ibid.,* VI, 15-16.
[53] *Ibid.,* VI, 19.
[54] *Ibid.,* VII, 7.

account and for disagreeing even as to these and not giving them their full due.

It would seem that these last chapters of the seventh book on the number of fixed stars would go better with the first chapters of the eighth book, where the thought of Favorinus is repeated from Aulus Gellius that there may be additional planets invisible to us, and where the number of the spheres is questioned, Alfonso the Wise having supposed a ninth sphere, although Ptolemy and Guido Bonatti were content with eight. Lucius Bellantius, by the way, in his reply to Pico's attack upon astrology declared this questioning the number of planets highly ridiculous. One might, he affirmed, as well assert that there were more than four elements.[55]

Again Pico contends that the signs of the zodiac are purely artificial and mathematical divisions and of no natural significance or virtue.[56] He also regards the figures which have been traced to connect the stars in constellations as mere figments of the human imagination.[57] He charges that the Arabic and medieval Latin astrologers invent other invisible images in each decan and *facies*, of which the ancient Greeks, Latins, Egyptians, and Chaldeans knew nothing.[58]

In the ninth book the difficulty of astrology is chiefly emphasized. Again the difficulty of determining the exact moment of birth is dwelt upon. It also is hard to find the true location of the planets in the heavens,[59] and opinions differ as to such matters as the movement of the eighth sphere.[60] The main contention of the tenth book is that the rules and methods of astrology are unreasonable. Pico sees no good ground for selecting one house as that of brothers, another of parents, and a third as the place of death. He questions the relation of the signs to different parts of the human body.[61] He censures Ptolemy's statement that the moon, Venus, and Mercury are affected by vapors from the earth.[62] He objects to the classification of the planets as harmful or salutary, and to the partitioning of the hours of the day among them.[63] The eleventh book argues that such assumptions are not only unreasonable but that they could not have been proved by experience as the astrologers assert. The prolonged astronomical observations attributed to the Chaldeans could not have been made, if we accept the Old Testament's chronology for the creation of the world and man. The twelfth book adds that they were not divinely revealed,[64] nor were they demonstrated by the Chaldeans and Egyptians whose wisdom, once highly esteemed by Pico, he now belittles.[65] He has, however, to explain somehow how the art of astrology originated. His explanation is that the Chaldeans so studied the stars that they formed a bad habit of referring all things to them, lacking any developed knowledge of philosophy to inhibit them from this and being untrained in dialectic so that they failed to detect astrology's sophistries and fallacies. The influence of idolatry and of the demons increased its hold.[66] It developed from mathematical and "parabolic" conjectures[67] and from the error of judging natural things as if they were mathematical.[68] By "parabolic" Pico means a conclusion based on mere association of ideas. He concludes his work with a reference to his precursors at the university of Paris in attacking astrology—William of Auvergne, bishop of Paris, Nicolas Oresme, Henry of Hesse, Ioannes Caton, and Brenlanlius Britannus.[69] Gesner, on the other hand, was to describe Brenlanlius as a distinguished astrologer who flourished about 1344.[70] John Cato is perhaps to be identified with Walter Cato, penitentiary of John XXII, who is said to have written against astrology.

To attempt to trace the future influence of Pico's book would lead us beyond the fifteenth century. We may only attempt now

[55] *Responsiones in disputationes Johannis Pici,* Florence, May 8, 1498; Venice, 1502; Basel, 1554, lib. VIII. See our next chapter, note 61, for reasons for questioning the date of the first edition. *Disputationes adversus astrologiam,* VIII, 3.
[56] *Ibid.,* VIII, 4.
[57] *Ibid.,* VIII, 5-6.
[58] *Ibid.,* IX, 8.
[59] *Ibid.,* IX, 11.
[60] *Ibid.,* X, 11.
[61] *Ibid.,* X, 13.
[62] *Ibid.,* X, 14-15.
[63] *Ibid.,* XII, 1.
[64] *Ibid.,* XII, 2.
[65] *Ibid.,* XII, 3.
[66] *Ibid.,* XII, 4.
[67] *Ibid.,* XII, 5.
[68] *Ibid.,* XII, 7.
[69] See Chevalier, I, 695, and Fabricius, I (1734), 748 *et seq.* Pits, however, like Pico represented him as a foe of astrology.

to give some notion of its immediate effect. Its author's wealth, station, and personal attractions contributed to its favorable reception as well as its intrinsic qualities. In the Florentine circle of Pico's friends and admirers the work was praised roundly, sometimes perhaps with only a hazy idea as to the detail of its argumentation, so that such praise, as in Ficino's case, need not imply complete identity of views as to the demerits or fallacies of astrology. Savonarola, as we have said, followed up Pico's work with a briefer paraphrase of its argument in Italian. Burckhardt affirms that Pico's main achievement was the setting forth in his fourth book of a positive Christian doctrine of the freedom of the will and the divine government of the universe "which seems to have made a greater impression on the educated classes throughout Italy than all the revivalist preachers put together." But he gives no proofs for his assertion.[71] The work of the Camaldulensian, Paolo Orlandini, against astrologers, which is extant in a manuscript dated 1514 but was perhaps written earlier,[72] seems not to mention Pico's book, although Orlandini, who died in 1519, was a Florentine and is described as a disciple of Ficino, with whom he discussed the priority of the intellect and will in 1496.[73]

More significant of the impression made by Pico's book is the response that it evoked from the astrologers whom it had attacked. Pontano was stung by the *Disputations against astrology* to include in the twelfth book of his *De rebus coelestibus* a derogatory passage on the perversion of Pico's genius, with a reminder of his condemnation by Innocent VIII. But on receiving news of Pico's death he cancelled and rewrote the passage.[74] In the third book of his *De fortuna*, written about

[71] Either in the German edition of *Die Kultur der Renaissance in Italien,* II (1904), 246, or the English translation (1929), p. 492.

[72] Since it is doubtful whether it falls within our period, I have relegated further account of it to an appendix.

[73] Della Torre, *Storia dell' Accademia Platonica di Firenze,* Florence, 1902, p. 832, citing a letter of Ficino to Paolo Orlandini of November 13, 1496, in his *Opera,* II, 1425.

[74] Soldati (1906), p. 230, gives the original passage from Pontano's autograph manuscript, Vatic. 2839, fol. 348r. Soldati prefers Pontano's pro-astrological system of nature to Pico's anti-astrological interpretation of the universe—*ibid.,* p. 253.

[75] *De fortuna* lib. III, ed. Aldine, 1518, fol. 300r: cited by Soldati.

[76] Hain, No. 2757, was mistaken in listing an edition of 1495 at Bologna by Benedictus Hectoris: see the *Gesamtkatalog der Wiegendrucke,* No. 3802. There is even some reason for believing that the editio princeps by Gherardus de Haerlem at Florence appeared only in 1499 rather than 1498: see below, p. 561, note 61. Bellantius was killed in 1499 by order of the tyrant of Siena, Pandolfo Petrucci.

[77] Gabriele Pirovano, *Defensio astronomiae,* Milan, 1507, Leonardus de Vigiis for Alessandro Minuziano, 72 folio leaves, vellum.

1501, he contented himself with the remark, "Nor will the authority of Giovanni Pico frighten us away, a man of great nobility and also of ability and learning, who recently tried to overthrow the science of the stars utterly."[75] Pico's book also led Lucius Bellantius of Siena, doctor of arts and medicine, who was then in exile from his native city and domiciled at Florence, to reply to some of its arguments in his *Responsiones in disputationes Johannis Pici adversus astrologicam veritatem,* first printed in 1498 together with a cognate work by the same author in twenty chapters on astrological truth (*De astrologica veritate*).[76] Each chapter or *Quaestio* discusses in scholastic style between three and thirteen subordinate problems, making the work over twice as long as the reply to Pico. These two works appeared again together at Venice in 1502, and at Basel in 1554. Bellantius took the attitude that not only was Pico's attack on astrology printed only after his death, but that Pico would never have published it, had his life been spared. Bellantius cited Aquinas and Scotus in support of astrology, but censured various past astrological writers such as the Arabic astrologers, Albumasar and Haly, Abraham Judaeus, and the Latin, Guido Bonatti. This censure was partly on Christian grounds but perhaps shared a little the current humanistic aversion for Arabic and medieval learning.

A Defense of Astronomy (i.e. astrology) by Gabriele Pirovano, a physician of Milan, was first printed separately at Milan in 1507,[77] and later was republished with altered title at Basel in 1554, together with the *Defense of Astrology against*

Pico della Mirandola of Lucius Bellantius.[78] It is a dialogue composed at some time after the death of Giovanni Galeazzo Maria in 1494.[79] Pirovano himself died in 1512, and his career lay chiefly in the previous century. He tells of the great impression which the comet of 1472 had made upon him,[80] and we have by him in manuscript a prognostication of 1484 addressed to Ludovico Sforza.[81] He also mentions as a recent case the remarkable sympathy or parallel behavior of Hippolita Sforza, duchess of Calabria, and her son, Peter, who fell sick at the same time and during their illnesses though separated always asked for food and even for such things as having their nails cut at the selfsame hour.[82] Hippolita Sforza lived from 1445 to 1488. Pirovano mentions Pico only once,[83] so that it is doubtful if his defense of astrology was primarily excited by Pico's attack upon it. Marsiglio Ficino is also cited, but Pirovano is inclined to hark back to earlier writings such as Alkindi on the projection of rays[84] which had been condemned by the faculty of theology at Paris among the books of Simon de Phares, Raymond Lull on the errors of astrologers,[85] and especially the *Speculum astronomiae* of Albertus Magnus.[86] Thomists and Scotists, Aristotle and Avicenna are also adduced as supporting the rule of the celestial bodies over inferior bodies.[87] The arguments against astrology which Pirovano lists and his replies to them are not, however, novel and need not be repeated here.

In 1502 there was printed at Nürnberg a defense of astrology by Jakob Schonheintz,[88] a doctor of arts and medicine and a Franconian.[89] He signs his preface at Würzburg.[90] The immediate occasion of this defense was "the impudence of a certain

[78] *Gabrielis Pirovani philosophi excellentissimi de astronomiae veritate opus absolutissimum* (or, *dialogus absolutissimus*), pp. 222-302, of the Basel, 1554, edition.
[79] *Ibid.*, p. 231.
[80] *Ibid.*, p. 268.
[81] BM Arundel 88, fols. 28r-29v.
[82] *De astronomiae veritate*, p. 227.
[83] *Ibid.*, p. 252.
[84] *Ibid.*, p. 229.
[85] *Ibid.*, pp. 237-238.
[86] *Ibid.*, pp. 229, 269.
[87] *Ibid.*, p. 244.
[88] *Apologia astrologie*, 21 Sept. 1502, Nürnberg, Geo. Schenck.
[89] "Ostrofranci arcium liberalium ac utriusque medicine Doctoris."
[90] "Datum Herbipoli."

man who wishes himself to be considered a theologian, although he is anything else than one," who had attacked astrology and its professors. Pity for the unlearned who may take his attack seriously has moved Schonheintz to reply. He furthermore regards this preliminary skirmish as a preparation for a future encounter, "not with a cursed scribbler, but with the most learned and most eloquent Giovanni Pico Mirandola, most generous count of Concordia." Schonheintz proceeds to say that no one has attacked astrology more bravely, no one more learnedly, no one with greater force and contention than Pico has.[91]

An unfavorable attitude to Pico's work was not confined to the astrologers. Pietro Pomponazzi of Mantua, the famous exponent of Aristotelianism at Bologna, in his *De incantationibus*, written in 1520, appears to allude to it as marked merely by verbal ornament, arrogance, and petulance.[92] On the other hand, Henry Cornelius Agrippa held that neither Lucius Bellantius nor any other defender of astrology had succeeded in answering Pico's arguments against the art.[93]

One astrologer who professed himself converted by Pico's book was Martin Polich of Mellerstadt in writings of 1499 and 1500,[94] but he relapsed into astrological prediction again in 1502, as we have seen.

Finally, the influence of Pico's work is seen in a *Compendium of the Most Notable Opinions Against Astrology,* printed at Modena by Rocociolo before the close of the century.[95]

[91] *Apologia astrologie,* fol. a i verso: ". . . donec mihi bracteato armatoque liceret precinentibus tubis inire pro astrologia litterarium certamen ad quod nunc me paro non cum maledico litteratore sed cum doctissimo et eloquentissimo Ioanne Pico Mirandula Concordie comite generosissimo congressurus. Nemo enim fortius nemo doctius nemo maiore vi ac contentione astrologiam impugnavit."
[92] Edition of Basel, 1556, p. 286: Pico is named in the margin, perhaps by the editor, Gratarolus, although not in the text.
[93] *De incertitudine et vanitate scientiarum,* 1537, cap. 31 (pages unnumbered).
[94] G. Bauch, *Geschichte des Leipziger Frühhumanismus,* 1899, pp. 96-100.
[95] Hain 5570, BM IA.32294: *Compendium sententiarum praeclarissimarum adversus astrologiam et eius fautores.*

CHAPTER LXII

ASTROLOGY AT BAY, II

SIMON DE PHARES

Well certified instances of condemnations of astrologers as such by Christian authorities are exceedingly rare, even when they taught the doctrine that religious changes were forecast or produced by conjunctions of the planets. Gabotto seems to adduce such an instance in his statement that in 1482 Giorgio da Novara was condemned at Bologna for teaching that a conjunction of Jupiter with Saturn produced Judaism, that its conjunction with Mars produced Chaldeism, that with Venus Islam, that with the sun the Egyptian religion, that with Mercury Christianity, and that a conjunction yet to be with the moon would bring antichrist.[1] But the passages in Battista Mantovano Spagnuoli and Muratori which Gabotto seems to cite for this event refer only to the burning at the stake of a George of Novara or Montferrat who in 1481 came to Bologna for an education and persisted in or relapsed into Judaism. He held that the true Christ had not yet appeared.[2]

More closely analogous to the condemnation of Simon de Phares which we are about to consider seems to have been a case in Germany two or three years earlier. In 1488 the theological faculty of the university of Cologne examined the astrologer Hartungus, or Hartung Gernod, concerning certain recent writings of his. "He answered ignorantly and insufficiently concerning certain articles." The result was that he was induced to promise to abstain from writing similar books in the future, and that the people were warned to hand over such copies of the works as they

[1] Gabotto (1889), p. 394.

[2] Muratori, *Scriptores,* XXIII, 902. Battista Spagnuoli Mantovano, *De patientia,* Venice, 1499, III, 13, "De Georgio Novariensi Bononiae combusto cum quibusdam disputationibus de fide christiana."

possessed to be burned. Further action was taken in this direction in 1489 by the official of the Cologne curia,[3] who also urged the people to denounce all necromancers, diviners, and sorcerers who were present in the city and diocese. If the *libelluli et seu sexterni* of Hartung to which objection was thus made, were merely annual astrological predictions of the sort current generally in Italy of the fifteenth century, we should have evidence of a greater theological and ecclesiastical opposition to them north of the Alps at Cologne. Even so, however, we should have to take into consideration that the Italian predictions were made by learned and properly qualified university professors, whereas Hartung was described as an ignorant person. However, as Hansen further notes, in 1492 the Cologne faculty recommended that the inquisitor arrest the famous astrologer, Johann Lichtenberger, for having predicted "killing or hanging" from someone's nativity.

While Pico della Mirandola was completing his twelve books against astrology and his brief life was drawing to a close, the case of Simon de Phares came before the Parlement of Paris and faculty of theology. Just as Pico himself a few years before had apparently attempted to flee from the censure of Rome to France and seek support at the university of Paris where he had studied and amassed some of his nine hundred theses, so the astrologer of Lyons, condemned by the archiepiscopal court there, had appealed his case to the central tribunal of the realm and perhaps himself had already come to the capital city to push his suit. Charles VIII, as we shall see, already in November, 1491, spoke of Simon as his astrologer. At least he was no longer living in Lyons in 1495, and in 1499 was said to be residing at Paris.[4]

Who was this Simon de Phares? His life had been a restless and varied one, if we may trust the brief autobiography which he modestly appends to the notice in his *Recueil des plus celebres astrologues* of master Florant de Villiers, who had drawn up

[3] Both his proclamation and the action of the faculty are given in Hansen, *Quellen,* pp. 502-506.

[4] Archives de Lyon CC. 292 and 230, cited by E. Wickersheimer, *Recueil* (1929), p. x.

Simon's horoscope when a child. He tells us that he had been from Scotland and Ireland to Alexandria and Cairo. Yet he was not a vagabond charlatan but a seeker after science. He had studied at Orléans, Paris, and for three years in medicine at Montpellier. He was long in the service of John, duke of Bourbon, to whom Conrad Heingarter has already introduced us. But when Louis XI wished to engage Simon, he turned to the mountains of Savoy and Switzerland, where he spent four summers searching for herbs such as the pseudo-Aristotle mentions to Alexander in the *Secretum Secretorum,* retiring for the intervening winters to Geneva, St. Moritz in Chablais, Syon, Bern, and Fribourg. This prolonged botanizing is interpreted by Wickersheimer as due to unwillingness to enter Louis XI's service and as terminating with his death in 1483. But is it necessary or safe to infer that Simon would return to the duke of Bourbon's service immediately after learning of Louis' death? And why was Simon reluctant to enter the king's service? His words are,

> . . . où je ne residé gueres que le roy Loys me voulsit aver; touteffois congnoissant ses inclinations, differé et m'en retournés ès montaignes de Savoye et voulu congnoistre des herbes.[5]

Was he mistrustful of Louis' personality, or did the king's horoscope and state of health indicate that he was liable to pass away soon, and that therefore a post as his astrologer or physician might be a difficult one? According to Thomas Basin some said that Louis XI became a leper shortly before his death. On July 8, 1483, he sent ships and troops to seek in 'l'Isle Vert et Pays de Barbarie' for things important to his health and well-being, and Eustache de la Fosse, who returned from Guinea in 1480, had made the statement that the blood of the turtles in the Cape Verde Islands would cure leprosy.[6] Can it be that Simon de

[5] *Recueil* (1929), p. 256. In this connection it may be noted that the emperor Frederick III so delighted in gardens that he was said to surpass the medical men of his day in his knowledge of herbs: Theodor Zwinger (1533-1588), *Theatrum humanae vitae,* 1604, V, i, 1222.

[6] Ch. de la Roncière, *La découverte de l'Afrique au moyen âge,* Paris, 1924, 1925, II, 29-31. On the anxiety of Louis XI as to his health in the last years of his life see also A. Chéreau, "Les médecins de Louis XI," *Union médicale,* XV (1862), 337-346, 529-536; XVI (1862), 145-153.

Phares hoped to find some marvelous life-giving herb that might restore the king to health, or gave this as an excuse for not entering the royal service? He does not say so.

After the death of the duke of Bourbon in 1488 Simon took up his abode at Lyons, where he soon won a great reputation for his astrological predictions. On All Saints Day, 1490, the young king of France, Charles VIII, visited him in his study and library and heard him answer by the stars the interrogations of all comers.[7] This royal notice seems to have brought Simon's activities a little too much into the public eye, and, whether from envy or other motives, he was, as has been said, soon condemned by the archiepiscopal court and forbidden to practice his art further. He himself stated in 1498 that his persecution began long ago with the royal patronage and the judgments which he had made for Charles VIII at both Lyons and Paris. Whether these last anteceded his appeal to the Parlement of Paris is less certain. But the plausible explanation of the affair would seem to be that Simon, forbidden the exercise of his art in Lyons, removed to Paris, encouraged by the king, and asked the Parlement for permission to practice there and for the restoration of his library. His books seem thereupon to have been brought to Paris and submitted by the law court to the theologians of the university.

Simon's case was transferred to the Parlement of Paris on June 14, 1491, and is mentioned in registers of the council of state of January 17 and April 22, 1493.[8] Earlier than that Charles VIII on November 10, 1491, had addressed from Laval a letter to the Parlement of Paris urging its members to settle speedily and favorably the process before them of "our dear and well beloved astrologer, Simon de Phares," as against the official

[7] P. Liron, *Singularités historiques et littéraires,* 1738, I, 313-316, dated Charles' call upon Simon at Lyons in 1495 on the king's return from the Italian expedition, but Wickersheimer shows that 1490 was the only year in which Charles could have been in Lyons on All Saints Day, while in 1495 Simon himself was residing at Paris.

[8] E. Wickersheimer in *Recueil* (1929), pp. viii-ix, citing the Archives nationales. For the case before Parlement in 1490-1491 of Guillaume des Rues, accused of heresy, magic, and practicing medicine without a degree or knowledge of Latin, see Félix Aubert, *Histoire du Parlement de Paris,* I (1894), 339.

or vicar of Lyons.[9] But the Parlement appears to have been in no haste to settle Simon's case, much less to settle it favorably to him. It was apparently some time before Parlement submitted his books to the examination of the faculty of theology, which reported upon them only on February 19, 1494.

In this report the faculty of theology first briefly rehearses the previous history of the case: that Simon de Phares who is stigmatized as a diviner (*mathematicus*) had in recent years been forbidden the practice of the art of genethlialogy or divinatory astrology by the archbishop of Lyons, and had appealed to the Parlement of Paris asking that his books of astrology be restored to him and that he be permitted to practice publicly this art which he contended was the noblest part of true astronomy. The Parlement had requested the faculty to examine Simon's books, and they had spent the last ten months on this task often meeting together and disputing as to their contents. The faculty roundly condemn divinatory astrology but permit astronomy, "which conjectures certain natural effects of the planets probably and prudently in a general way." The *mathematica ars* or divinatory astrology is defined as that which predicts determinately and particularly men's future *mores* from their natal hours, or from the initial hours of undertakings forecasts their future outcome. Interrogations and astrological images are condemned along with such nativities and elections, but it is noteworthy that revolutions and conjunctions are not con-

[9] *Lettres de Charles VIII roi de France,* ed. P. Pélicier, III, 1490-1493, Paris, 1902, pp. 204-205. Since the letter is brief, I reproduce it in full.

"Au Parlement de Paris Laval 10 novembre 1491

De par le roy

Nos amez et feaulx, nous avons esté presentement (205) advertiz que nostre cher et bien amé astrologue Simon de Phares a certain procés pardevant vous à l'encontre de l'official ou vicaire de Lyon, duquel il desire fort avoir fin. Et, pour ce que desirons nostredict astrologue estre en ses faiz et affaires favorablement traicté, nous vous mandons et expressement enjoignons que en la meillure et plus briefve expedicion de justice que faire se pourra vous vacquez et entendez à la decision et avancement dudict procés, en maniere qu'il en puisse de brief avoir l'expedicion, en aiant tousjours son bon droit en singuliere recommandacion. Donné à Laval, le x^e^ jour de novembre.

(Non signé.)

ROBERTET

A nos amez et feaulx conseillers les gens de nostre court de Parlement à Paris. *Recepte xxiij^a^ novembris M°CCCC° nonag° primo.*"

demned. This would save the annual predictions then so common. Out of all Simon's library the faculty select eleven volumes to be burned, although a few of the treatises contained in even these volumes are found unobjectionable. The treatises to be burned include various works of the Arabic astrologer, Albumasar, Abraham Judaeus on nativities, the *Isagoge* of John of Spain, William of England's *De urina non visa*—a work telling how to diagnose the patient's case from the stars without examining his urine, the Latin translation of the pseudo-Hippocrates on astrological prognostication according to the moon by Pietro d'Abano, and a *Repertorium pronosticum de mutatione aeris* which was really the work of Firminus de Bellavalle on weather prediction. If these were the worst works the faculty could discover in Simon's library, it must have been relatively free from works of superstition. The volumes condemned included some of the most used books of medieval astrology and medicine. It does not seem that censure of them even by so high and learned a body as the faculty of theology of Paris would have much effect in restricting their circulation or influence. Nor does the faculty seem consistent in what it condemns and approves. While one treatise on weather prediction is condemned, another by Alkindi on the same subject and with the same title, *De mutatione aeris,* is approved.

Acting upon the basis of this report the Parlement on March 26, 1494, refused to entertain Simon's appeal to itself and condemned him in costs. It is stated that Simon had confessed at Lyons to revealing thefts, hidden treasure, and men's secret thoughts and had expressed penitence therefor. Further stating what was hardly the fact, that Simon's books or the greater part of them—only eleven out of two hundred had been condemned —were evil, superstitious, and contrary to the Christian faith, the Parlement directs that these and Simon himself be turned over to the official of Paris and inquisitor for further examination. It is suggested that Simon's appeal has been equivalent to a relapse on his part.[10]

[10] Du Plessis d'Argentré, *Collectio judiciorum de novis erroribus,* 1755, I, ii, 328-330, dated Mch. 26, 1494 ("1493 before Easter").

One wonders to what extent opposition of the Sorbonne and Parlement to the crown, which became so marked in the next reign of Francis I, may have motivated this condemnation of Simon. For condemning Simon was indirectly to condemn the king for having visited and consulted him—the more so if such consultations had taken place at Paris since Simon's condemnation at Lyons—and for calling him his dear and well-loved astrologer. It is a significant circumstance that the action of Parlement, and perhaps even the report of the theological faculty, occurred after the king was well embarked upon the Italian expedition. He had left Amboise before the faculty made its report and on March 6, 1494, entered Lyons to complete the preparations for the Italian expedition.[11] He was not to return from Italy until late in 1495. Indeed, judging from his letters he appears to have last written from Paris on July 12, 1493, and not again to have entered the capital.[12] With the king on the Italian expedition was Jean de Ganay, patron of Lefèvre and correspondent of Ficino, who as fourth président of the Parlement of Paris might have prevented or softened Simon's condemnation, had he been present at the time in the French capital.[13]

What became of Simon in the interim we are not informed. Lea, in his history of the inquisition in the middle ages, leaves us with the vague impression that he perished at the stake, remarking, "The Parlement accordingly pronounced a judgment handing over the unlucky Simon to the bishop and inquisitor of Paris, to be punished for his relapse."[14] But we find Simon

[11] *Cambridge Modern History,* I, 111.

[12] *Lettres de Charles VIII,* ed. P. Pélicier, 1898-1905, vols. III-V. Ernest Petit, "Séjours de Charles VIII," *Bulletin historique et philologique* (1896), pp. 630-690.

[13] Della Torre, *Storia dell' Accademia Platonica di Firenze,* Florence, 1902, p. 832, cites a letter of Ficino who had left the city to Jean de Ganay, then in Florence, at the close of the year 1494.

[14] H. C. Lea, *A History of the Inquisition of the Middle Ages,* III, 445-446. Merlet, "Lecture d'une biographie de Simon de Phares," *Procès-Verbaux de la Société archéologique d'Eure-et-Loir,* VI (1880), 286-291, held that Simon composed the *Recueil* before the decree of Parlement and said, "Que devint Simon de Phares après cette condamnation? Mourut-il dans les prisons de l'officialité? Nous n'avons aucun renseignement à cet régard."

still alive in 1498, the last year of the reign of Charles VIII, and from what he says then of his adversary, detractor, and detractors it would appear that they had been seriously discomfitted during the interval. His calumniator, he gives us to understand, had died "confounded and put to shame," as Jean Gerson was for attacking the *Romance of the Rose.*[15] Later Simon specifies "my calumniator" by name as the chancellor Rochefort, and states that when master Bertholt, a canon of Lisieux and doctor of medicine, brought to Paris the nativity of the queen, he communicated the same to the chancellor and remonstrated with him for his opposition to astrology which had so many uses. Rochefort, according to Simon, was so upset by this that shortly afterwards he became out of his senses and died mad.[16] The allusion must be to Guillaume de Rochefort, chancellor of France from May 12, 1483, to August 12, 1492, since Guy de Rochefort became chancellor only on July 8, 1497, and did not die until January 15, 1508. Guillaume de Rochefort's death was evidently insufficient to alter the attitude of university and Parlement to Simon, however, since they proceeded later to his condemnation. Simon also refers to "our adversary, Jehan Quentin," a preacher whom he twice charges with having plagiarized his sermons, which had been composed "before his mother was born" by Germain du Bois.[17] Simon further hints that he would like to see the members of the Parlement skinned alive.[18] From such outspoken expressions we would scarcely infer that Simon was languishing in the prisons of the inquisition when in 1498 he addressed his history of past astrologers to Charles VIII. As a relapsed heretic he would surely not have been permitted to write on such a subject and in

[15] *Recueil,* etc. (1929), p. 249, "confuz et ahonti, ainsi que nostre calumpniateur."

[16] *Recueil* (1929), p. 267.

[17] *Ibid.,* pp. 248, 267. This Jean Quentin was associated with the Collège de Sorbonne from 1465, but in 1478 the opinion was expressed that he should no longer hold a *bursa* or scholarship because he seemed to have sufficient other income. Doctor in 1472, canon in 1482, penitentiary in 1489, in 1496 he was chosen bishop of Senlis but vainly contested the post with a papal provisor. See Renaudet, *Préréforme et humanisme à Paris,* 1916, pp. 14, 15, 48, 171.

[18] *Recueil* (1929), p. 74.

such a vein as he did, making flings at his adversaries, ascribing to great men of the past the very practices for which he had been condemned, combatting the arguments of his detractor or detractors against astrology, maintaining a view as to what astrology was permissible quite in contradiction to that of the faculty of theology, and urging the crown to continue its past patronage of that art. Moreover, it seems evident that he could not have composed the *Recueil,* with its long history of astrology and many citations of past astrological works down to their very incipits, without the use of an extensive library. Indeed, he himself states that he uses his own books and a few others in composing the *Recueil.*[19] He gives us no hint that his life or personal liberty is in danger, but writes as if it were merely a question of defending the condemned volumes from the charge of being superstitious. Immediately after the salutation to the king his work opens: "Because certain ignorant detractors and enemies of the science of astrology have willed seditiously to charge some of my books with superstition, though they treat purely of the science of astrology . . ., I have decided to employ my slight understanding in making you this present *Elucidaire* to show you and to give those detractors clearly to understand that astrology is a true science."[20]

The more natural inference therefore appears to be that Simon either was not punished at all or was released by the king upon the latter's return from Italy, and that his books, or at least most of them, had been returned to him. At any rate Simon had, so far as we know, the last word in the struggle which the archbishop of Lyons had started. Pico ended by attacking astrology, Simon ended by defending it. He dwells upon the ignorance of his detractors and affirms that they know neither Greek nor Hebrew and so think that any strange scientific term from another language must be the name of a devil and a proof of evil magic.[21] Simon de Phares, whose name suggests that he may have been of Jewish ancestry, had read the Talmud[22] and

[19] *Recueil* (1929), p. 13.
[20] *Ibid.*, p. 1.
[21] *Ibid.*, pp. 1, 9.
[22] *Ibid.*, p. 46.

was proud of his acquaintance with Hebrew literature.[23] He declares that astrology is a pure subject very different from superstitious arts of divination, though their practitioners may sometimes use it. But simply because a snake or other venomous beast drinks from a clear fountain, it does not follow that the fountain should be annihilated or that no one should henceforth drink from it.[24] The detractor admits that it is lawful to study the movements of the stars, but Simon asks why one should study them save to learn their influence.[25] He further denies the charge of his detractors that astrologers are seldom altruistic.[26] Simon in addition appeals to the king not to allow this noble science of astrology to be driven from France.[27] His own long persecution had been started because of the royal support he received and his judgments for Charles VIII. The attack upon him is an insult to that monarch because his royal predecessors, especially Charlemagne, Charles V, and Charles VII, had been patrons of astrology.[28] It is of aid to kings and has revealed plots made against them.[29] Charles the Bold was defeated by disregarding the warning of his astrologer, and if Charles VIII does not make use of the art, he may be certain that his foes will none the less employ it against him.[30]

As its title indicates—*A Collection of the Most Celebrated Astrologers*—Simon's work of 1498 is primarily a historical defense of the subject against which Pico had directed a dialectical attack. He proposed to treat of the principles of astrology in a second part and of superstitious arts in a third,[31] but these sections of his work have not reached us and were perhaps never written, since the *Recueil* ends abruptly with the year 1495, interrupted it may be by the death of Charles VIII. Simon's long account goes back to the early ages of the world to find the first astrologers among the patriarchs of the Old Testament, heroes of Greek mythology, and ancient kings of Assyria. Much

[23] *Recueil* (1929), pp. 65, 82.
[24] *Ibid.*, p. 2.
[25] *Ibid.*, p. 6.
[26] *Ibid.*, p. 95.
[27] *Ibid.*, pp. 7-8.
[28] *Ibid.*, pp. 3-4.
[29] *Ibid.*, p. 7.
[30] *Ibid.*, p. 10.
[31] *Ibid.*, pp. 11-12.

space is given to names from classical antiquity, but the account becomes really valuable from a biographical and bibliographical standpoint as the author approaches his own time and deals with a host of learned men of the fourteenth and fifteenth centuries. Then his dating and identification of authors becomes more exact and he gives many precious bits of information which we have utilized in previous chapters. Simon has, of course, a tendency to represent past men of learning as more favorable to astrology than they actually were and to multiply instances of predictions which came true, but this bias is not difficult to discount.

Simon records one or two cases like his own of persecution or attempted persecution of astrologers earlier in the fifteenth century. About 1430 master Jehan de Guignecourt, one of the leading scholars at Paris, defended before the whole university the *Almagest* of Ptolemy, "which some fool theologians had wished to condemn."[32] In the *Chartularium* of the university, however, there seems to be no reference to such a controversy or disputation. Jehan de Guignecourt was prominent at the university of Paris[33] but in the later fourteenth century, when he was chancellor from 1386 to 1389. The only controversy with theologians in which he appears to have been implicated was that of 1387 with the Dominican, John de Montesono, some of whose opinions displeased the university. Some of these fourteen propositions[34] touched on the theme of necessity, which possibly might have brought the discussion around to Ptolemy, but it seems unlikely.

A Spaniard, whom Phares calls Loys de Langle, flourished at Lyons in medicine and astrology and answered the questions of all comers. He predicted to Charles VII the battle of Formigny in 1450; he forecast the poisoning of the little prince

[32] *Recueil* (1929), p. 252.

[33] Consult the index of vol. III, *Chart. Univ. Paris.*, Paris, 1894. He was a bachelor of theology as well as a member of the faculty of arts, but he never went on to the doctorate in theology. Yet in 1406 he was reputed the greatest clerk in the world.

[34] They will be found listed *ibid.*, pp. 493-495. Jehan de Guignecourt is mentioned in connection with the affair at pp. 489-490.

of Piedmont; he predicted to Charles a pest at Lyons. Several ignorant persons, moved by envy, accused him of superstition before Charles VII, but he showed that his forecasts had been purely astrological and presented the king with a copy of his astrological work, entitled *Vade mecum,* which they had condemned because it was beyond their comprehension. The king acquitted him, pensioned him, and sent him back to Lyons to continue his astrological practice. The tacit moral in Simon's mind no doubt is that Charles VIII should do likewise in his own case. Loys de Langle also translated the work on nativities of "Hyspalense"[35] from Spanish into Latin and made a commentary on Alcabitius. Simon de Phares had all his works in his own handwriting before him as he wrote. Finally he asserts that Loys predicted his own death to the day and began his last devotions and shriving a fortnight beforehand.[36]

This Louis de Langle figures also in the record of the trial of Jean, duke of Alençon, who was condemned to death by Parlement on October 10, 1458, but pardoned by Charles VII. Hance de Saint Dié testified that in the service of the duke he twice visited Louis de Langle at Lyons and a hermit at Milan who was expert in surgery, obtaining from the former a charm to enable the duke to enjoy the company of the duchess which was exactly repeated by the hermit, apparently without possible collusion. When the charm failed to work well, Hance went off to Milan again. He did not see Louis de Langle on his way south but on returning with an unsatisfactory response from the hermit he consulted Langle again and was told that the duke would withhold his expenses for the trip.[37]

A few more particular passages may be noted to illustrate Simon's mental attitude and combination of science and superstition. Astrology for him surpasses geomancy as Hercules surpassed Antaeus. He accepts the existence of the salamander, which lives in fire and from whose skin under certain constella-

[35] John of Spain, the translator of the twelfth century, is probably meant.

[36] *Recueil* (1929), p. 258.

[37] A. Chéreau, "Les médecins de Louis XI," *Union médicale,* XV (1862), 344-346.

tions are made "things incredible to many," a discovery ascribed by some to Meliclaus, celebrated among the Lacedemonians for his astrological predictions.[38] Simon further narrates the experimental discovery that peacock's flesh will not putrefy, especially if the bird is hatched under a certain constellation,[39] and mentions a marvelous water which he has seen which will dissolve and cast metals without being heated and which has marvelous properties in surgery.[40] He tells of a cemetery at Turin where nothing is left of a body after it has been buried for three days.[41] He states that Theligonus of Athens devised a potion to make women conceive in a certain constellation.[42] He recounts various magical feats performed by Virgil, including an invisible garden in the air and the building of the Colosseum with magic wooden figures that sounded alarm bells whenever rebellion threatened.[43] Much, indeed, of Simon's history of science and of civilization is of a fabulous sort. He has a long account of Ionicon, "one of the last sons of Noah," to whom he ascribes, if not the invention of astrology, the doctrine of four kingdoms and the rediscovery of the columns which Adam, Tubal, and Tubal Cain had engraved with all the secrets of the liberal arts.[44] He tells of Esculapius studying the stars in mirrors, of Xerxes' inventing chess—a Persian game it is true, and of the burning of 600,000 books in ancient Babylon—in ignorance of the fact that they were written on clay tablets.[45] He also frequently mentions experimentation, but it may be astrological in elections and nativities as well as natural with gums, roots, and herbs.[46]

Simon's work was less immediately influential than Pico's.[47]

[38] *Recueil* (1929), p. 45.
[39] *Ibid.*, p. 52.
[40] *Ibid.*, p. 59.
[41] *Ibid* (1929), p. 111.
[42] *Ibid.*, p. 110.
[43] *Ibid.*, pp. 114-116.
[44] *Ibid.*, pp. 19-20; concerning Ionicon, Ioanton, or Ioathon see Haskins, *Mediaeval Science*, 1924, pp. 341-344, and Sackur, *Sibyllinische Texte und Forschungen*, 1898, pp. 15, 54, 64. Neither uses Simon's account.
[45] For these three passages, *Recueil* (1929), pp. 47, 73, 70.
[46] *Ibid.*, pp. 89, 121.
[47] In the seventeenth century Père Labbe published some extracts from it in his *Recueil historique de pièces anciennes.* In the eighteenth century it received considerable attention: see P. Liron, *Singularités historiques et littéraires*, I (1738), 313-316; J. B. L. Crevier, *Histoire de l'université de Paris depuis son origine jusqu'en l'année 1600*, Paris, 1761, IV, 470, 494; Jean Lebeuf, "De l'astrologie qui avait cours sous Charles V et des plus fameux astrologues de ce temps," in his *Dissertations sur l'histoire ecclesiastique et civile de Paris*, 1739-1743, Tome 3, and reprinted in *Collections des meilleurs dissertations relatifs à l'histoire de France*, ed. C. Leber, Paris, 1838, XV, 397-408. Lebeuf published an extract from the *Recueil* of Simon. It was again utilized by Charles Jourdain in his article, "Nicolas Oresme et les astrologues de la cour de Charles V," which was reprinted posthumously as chapter 20 of his *Excursions historiques et philosophiques à travers le moyen âge*, Paris, 1888.

It is doubtful if Charles VIII, who died the same year in which it was written, 1498, lived to read it, and only the single autograph manuscript of it, written in French,[48] has come down to us. What became of Simon after the death of his royal patron we do not know, except that the tax records of Lyons in the following year, 1499, refer to him as "residing in Paris,"[49] but his book, at least, was not destroyed. To show how sporadic and desultory such action as that against Simon was there may be cited another notice that follows close after the documents concerned with his case in the collection of d'Argentré.[50] According to Trithemius and Surius, in 1501 there appeared openly at Lyons, the very city where Phares had first been brought to trial and condemned, a magician from Italy, named John or Mercury, with his wife and children, all clad in linen after the manner of Apollonius of Tyana, and wearing an iron chain about the neck. He claimed not only to possess all the science of the ancient Hebrews, Greeks, and Latins but to far surpass them. He affirmed that he could transmute metals and change happiness to unhappiness or vice versa, and all this by natural magic. He enjoyed the favor of the French king to whom he presented a magic sword and a magic mirror, made under favoring constellations. The king had him examined by his physicians—not a physical examination, however, but an intellectual disputation —and they agreed that he knew more than other mortals. The king gave him gold, but he distributed it all to the poor. In this

[48] BN fonds français 1357.
[49] *Recueil* (1929), p. x.
[50] Du Plessis d'Argentré, *Collectio judiciorum*, 1755, I, ii, 343, quoting Trithemius, *Chron. Sponheim.*, p. 414, and citing Surius, *Appendix ad Chronica Naucleri*, p. 527. See also Du Boulay, *Historia universitatis Parisiensis*, 1668, VII, 4-5.

instance the royal patronage of occult arts seems not to have led to any persecution of their practitioner. Perhaps the fact that there was a new archbishop of Lyons after 1500 made some difference, or the further fact that Louis XII was in Lyons from early in June to the end of October, 1501.[51]

Even, however, while Simon's case was still pending, Aegidius de Wissekerke, or Willem Gilliszoon, in the year 1492 either presented to, or left for Charles VIII "in the city of Lyons and at Tours" a *Royal Sphere*.[52] It does not seem to be extant, but two years later Aegidius, who though a native of Zeeland wrote at Carpentras, published at Lyons a treatise on the movements of the heavenly bodies which also contains not a little astrology.[53] The chief aim of this work was to enable one to find the positions of the planets without arduous calculation from tables. The prime purpose in this was of course astrological, and Aegidius noted that the prognostications printed on the conjunction of 1485 were vitiated by an error which placed Saturn and Mars in the ninth degree of Scorpio on the last of November, whereas actually on that day Saturn occupied the fifth degree of Sagittarius, while Mars was in the twenty-ninth degree of Scorpio. Their conjunction did not occur until December ninth and was in the ninth degree of Sagittarius.[54]

Aegidius further has a number of chapters on astrological medicine[55] and concludes his treatise with a general discussion as to the extent of the influence of the stars. He makes the not unusual distinction that while the influence of the stars upon inferior bodies is necessary, effects in these inferiors do not of

[51] But of course no great dependence can be put upon Trithemius' chronology for the magician.

[52] As he states at fol. (a.vii.) recto of the edition to be cited in the following note: ". . . que pro nunc causa brevitatis relinquo que clare et oculata fide perpendi possunt in superiori parte spere regalis quam domino Charolo Francorum regi christianissimo reliqui in civitate Lugdunensi ac Turoniensi anno domini 1492." Possibly the royal sphere was an elaborate astronomical instrument rather than a treatise.

[53] GW 263, 264. I have used the former edition at the Mazarine library, Paris. Titulus: "Liber desideratus super celestium motuum indagatione sine calculo." The second edition was printed at Cremona (BM IA. 30841).

[54] *Op. cit.*, fol. a.iii, verso.

[55] See his "Sexta pars principalis," caps. 4, 7, 8, 9, 10, 11.

necessity follow that influence. A second proposition of his is that although the celestial bodies do not exert a direct impress upon our intellects, they do affect them indirectly and by way of disposition, not necessity, through our bodies. In this connection he quotes the commentary of Duns Scotus on the *Sentences* that "that ethereal globe which is called the sky governs all elements and bodies compounded from them by certain law," and likewise the human body and all organs of sense. The will can resist, but most men follow appetite, desire, and evil, and hence astrologers' predictions as to human morals are often true —a position for which it was more usual to cite Aquinas than Scotus. However, as Aegidius lays down in his third proposition, the celestial movements are not the cause of our acts of will and election. In respect to his will, man is directly subordinated to God; in respect to his intellect, he is open to angelic persuasion; in respect to his body, he is disposed by the stars. Aegidius has affirmed earlier in the treatise that he cannot believe that the true time of the coming of antichrist can be investigated from the stars.[56]

These three propositions of Aegidius may seem less extreme and more in the manner of a compromise than Simon de Phares' profession and practice of astrology. But it is probable that he at least, if not the faculty of theology at Paris, would have accepted them readily enough. Their enunciation in the same city where Simon's astrology had been condemned only four years before and just after his condemnation by the faculty and Parlement at Paris is certainly suggestive. Apparently the condemnation of some of Simon's books did not decrease the demand for astrological manuals in Lyons, and his departure doubtless left other practitioners of the art in both Tours and Lyons, and all the way from Zeeland to Carpentras. In his prologue Aegidius informs us that he had elsewhere communicated a similar book to certain friends of his but not so completely and openly. He further expresses the hope that his manual may keep its readers from other perverse and illicit arts with which the spirit of dark-

[56] *Op. cit.*, fol. a.iiii, recto.

ness blinds human minds and which are harmful to both soul and body.[57] If this was a hint to the opponents of astrology that they might better direct their energies against witchcraft, it also was a somewhat dangerous admission of a certain association or similarity between astrology and other occult arts.

The condemnation of Phares scarcely acted as a deterrent to astrology even in Paris itself. The Italian humanist, Fausto Andrelini, a pupil of Filelfo and an elegiac poet who gave courses on Livy, Suetonius, and the *Sphere* of Sacrobosco at the university of Paris, in 1496 addressed to Budé and printed his poem, "On the Influence of the Stars with a Complaint as to the State of the Pavements of Paris."[58] On the latter point his uncomplimentary and truly nasty remarks could hardly have been pleasing to that city, and possibly his astrological reflections and numbers were no more favorably received. At any rate he made them. His astrology was not extreme, however. In his poem he recounts the formation of the foetus under the influence of the planets, relates the parts of the human body to the twelve signs, and saves human free will. Robert Gaguin, on the other hand, the central figure of the native French humanistic movement at Paris during the latter half of the fifteenth century, in a letter of September 16, 1496,[59] took up with regard to astrology an orthodox attitude strictly in accord with Pico's book and the recent condemnation of Phares, although he makes no allusion to either.

It was under Alexander VI that not only was Pico at last excused for his nine hundred theses and *Apology,* but that Paul of Middelburg in Zeeland, who had been issuing annual astrological predictions since 1478, who taught astronomy at the university of Padua in 1479, and who in 1480 became the duke of Urbino's physician, was in 1494 made bishop of Fossombrone, a post from which he did not resign in 1524, as has often been stated, but held until his death in 1533, when Paul III called him to Rome with the intention of making him a cardinal.[60] If Pico, after his pardon, went on to attack astrology, that was Savonarola's doing rather than Alexander VI's fault. The elevation of the seer of Zeeland to the episcopacy and his prominence at the Lateran council of 1512-1517 in connection with the problem of calendar reform shows that if certain critics, including in their number clerics and prelates, were attempting to hold astrology or astrologers at bay, the art and its representatives could still find a refuge in church as well as state. The pack, personified by Parlement or theological faculty, might bark at an occasional astrologer like Simon de Phares, but the master of the hounds, whether a Charles VIII or an Alexander VI, would call them off. It was Savonarola who wrote against astrology that went to the stake. Indeed, Bellantius in replying to Pico affirmed that the career of Savonarola had fulfilled the prediction made by Paul of Middelburg of the advent of a false prophet, and that he himself, as many persons at Florence could testify, had predicted from Savonarola's horoscope five months before his fall that he was inclined to heresy and would end his life by the noose.[61]

[57] *Op. cit.*, fol. a.iiii, verso.

[58] Publii Fausti Andrelini Foroliviensis poete laureati ad Guillermum Budeum Parrhisiensem patricium, graeca et latina litteratura insignitum, *de influentia syderum et querela Parrhisiensis pavimenti carmen,* Paris, 1496: I have used a copy at the British Museum. See also L. Thuasne, "Rabelaesiana," *Revue des bibliothèques,* XIV (Nov.-Dec., 1904), 281-304.

[59] See Thuasne's edition, II, 22-39, Letter 77.

[60] A recent study on Paul of Middelburg is that of D. J. Struik, "Paulus van Middelburg (1445-1533)," *Mededeelingen van het Nederlandsch Historisch Instituut te Rome,* V (1925), 79-118. See also H. de Jongh, *L'ancienne faculté de théologie de Louvain 1432-1540,* 1911, pp. 83-86.

[61] Lucius Bellantius, *Contra Picum,* Bks. I and V. In the edition of Venice, 1502, fol. q.ii, recto, "Nam multis ante temporibus falsi prophete adventum astrologia denuntiavit ut inter cetera apparet per prognosticum singularis viri Pauli Theutonici qui aperte talia in religionem monstra iam diu dictis et scriptis fore ostendit"; fol. (s.iv.) recto, "Quare excellentissimus ille vir Paulus Fo. Sem. epi. fallacis prophetae adventum predixit et unde originem trahere ubique populos seducere debebat . . . complures sunt autem Florentiae testes fide dignissimi quibus inspecta Hieronymi Savonarolae genitura quinque ante eius iacturam menses dum florebat et ipsum Hiero. ad heresim inclinatum et laqueo vitam terminaturum predixi." Savonarola was of course strangled before being burned. I was doubtful if this passage would be found in the first edition of Bellantius' work, since it was published May 9, 1498 (GW 3802), while Savonarola was not executed until May 23 of that year. But it occurs there too at fol. (s v) recto, col. 1-2. It may therefore be questioned whether this edition by Gherardus de Haerlem, "Florentie die viiii Maii M. cccclxxxviii," is correctly dated and should not be 1499.

CHAPTER LXIII

FICINO THE PHILOSOPHASTER

The mystical bent of Marsilio Ficino[1] and his hospitable attitude to occult science and philosophy is evidenced by his editing or translating works of Hermes Trismegistus, Iamblichus on the mysteries, Proclus on sacrifice and magic, Synesius on dreams for king Matthias of Hungary,[2] and Psellus on demons, not to mention Pythagoras, Plotinus, and Porphyry. The same attitude is also found in Ficino's own writings, though these are fewer and briefer than his translations and commentaries. In his *Apology,*[3] addressed to three Peters, Nero, Guicciardino and Soderino, and dated September 15, 1489, he defends himself against those who ask what concern he, as a priest, has with medicine and astrology, or, as a Christian, with magic and images. He replies successively through the mouths of the three Peters mentioned that most of the ancient priests were also physicians and that Christ, who bade his disciples go throughout the world curing the sick, likewise bids priests, if they can not heal with words as these once did, at least to heal with herbs and stones. And God, who through the influence of the heavens directs dumb animals to appropriate medicines, will surely permit priests to practice astrological medicine.

As for magic and images, Ficino holds that in commenting

[1] For Ficino's works other than his letters I have used the edition of Basel, Henricipetri, 1576; for the *Epistolae* the edition by Koberger, 1497. The epithet, *philosophaster,* was applied to Ficino by the Spanish humanist and literary critic, Vives: *De conscribendis epistolis,* in the collection headed, *Lippi Brandolini de ratione scribendi,* Basel, 1549, p. 361, "Admiscuit se his philosophaster Marsilius Ficinus ut oloribus gavia atque epistolas composuit ut de Platonicis quaestionibus disputaret dictione invenusta et molesta."

[2] Wolfenbüttel 2024, 1484 A.D., de luxe, illuminated, fols. 1v-25v: Synesii Platonici liber de vaticinio somniorum e Greco in Latinum translatus a Marsilio Ficino . . . Florentino ad Mathiam Pannoniae regem semper invictum.

[3] Marsilii Ficini *Apologia in qua de medicina, astrologia, vita mundi, item de magis qui Christum statim natum salutaverunt agitur: Opera,* I, 572-573.

upon Plotinus he merely discussed rather than approved of them. He proceeds further to differentiate diabolical from natural magic. So long as the latter employs legitimate means, it seems to him entitled to the same freedom as medicine or agriculture. He does not see why his contemporaries are so prejudiced against the word, *magi,* when the three Magi play so fine a part in the Gospel narrative. Of natural magic again there are two varieties, the one curious and given to idle ostentation of its feats, as when the Persian magicians by allowing salvia (saliva?) to putrefy in a dunghill, while the sun and moon occupy the second *facies* of the sign Leo and the same degree, generate something like a blackbird with a serpent's tail, which they reduce to ashes and pour on a lamp with the result that the house straightway appears full of snakes. This variety of magic Ficino thinks should be shunned as idle and noxious. But he approves of natural magic which employs things of nature with celestial influences for medicinal purposes. Defending his belief in a world soul, he inveighs against those who are so blind and superstitious that they see life in the lowest animals and vilest herbs but deny it to the heavens and universe.

Ficino in his correspondence cited incidents to show the soul's power of divination.[4] He believed that it remained conscious after death, indeed became more clearly conscious than while in the body.[5] With this went a hospitable attitude towards belief in spirits and demons. Writing to Philip Valori on the occasion of the death of Lorenzo de' Medici, Ficino argues that the prodigies which mark the deaths of great men and especially of princes, are not casual or merely natural occurrences but are the work of the great man's familiar demon and guardian angel, or of the genius of the place affected, or of the spirits above who welcome him home. To these three varieties of spirits correspond three kinds of prodigies. The celestial beings produce comets, thunder and lightning, and other phenomena in the heavens. The genius of the place shakes and destroys buildings

[4] *Epistolae,* liber I, ed. of 1497, fol. 6v. [5] *Ibid.,* fols. 13v-14v.

(*machinas*), and produces oracles, auguries, and auspices. The personal genius makes himself felt in dreams, the barking of dogs, and like manifestations.[6]

In a letter to Braccio Martelli[7] Ficino sets forth further his Neo-Platonic theory of demons, which he says will illustrate how closely the Platonists agree with our religion. The Platonists offer no other sacrifice than contemplation to God and the world soul, but dedicate flowers and fruit to the souls that move the stars. Demons are invisible beings beneath the orb of the moon with gaseous bodies composed of *spiritus*. Those who have their bodies under best control are good and beneficial. Those who have least control over the *spiritus* to which they are joined are of evil nature. They cause such ills as wars and pestilence, which should not be ascribed to God. The good spirits try to warn us in dreams and other ways of the machinations of the evil demons, but not everyone can sense their warnings. The evil demons live on the vapors of suffumigations and animal sacrifice, and deal in love philters and sorceries. If the theologians sometimes permit animal sacrifice to such evil demons to avoid disasters, they at the same time forbid one to taste such sacrifices and require one beforehand to purge one's soul with fasting and especially by abstinence from flesh of animals. Even fascinators and sorcerers whose aim is the gratification of lust observe personal purity as a precaution against the demons.

Ficino's *De vita studiosorum* contains chapters with such astrological headings as, What props old men receive from the planets to support all their limbs, Of the converse of old men in green pastures under Venus, and, Of avoiding the dangers which threaten from every seventh year of one's life.[8] He explains that when astrologers say that Venus and Saturn are mutual enemies, this is not to be taken literally, since in the sky all things are moved by love. It merely means that they are diverse in their

[6] *Ibid.*, liber XI, ed. of 1497, fol. 221r, letter of 25 April 1492.

[7] *Epistolae,* liber VIII, ed. of 1497, fols. 184r-186v. The epistle opens with an incipit which was common then, "Cum superioribus diebus," continuing, "apud Phillippum et Nicholaum Valores. . . ."

[8] See caps. 13, 14, and 20.

effects. A "medicine of the Magi for old men" consists of pills made of frankincense, myrrh, and gold-leaf.

In the *De vita coelitus comparanda,* dedicated to the king of Hungary on July 10, 1489, we again encounter Ficino's belief in the world soul. He holds that our spirit draws in the spirit of the universe through the rays of the sun and Jupiter, and in a later chapter again discusses how our spirit may draw most from the spirit and life of the universe.[9] The relation of the planets to medicine is treated.[10] Ficino believes that not only natural things but also artificial objects receive occult virtues from the stars,[11] and he discusses the theory of astrological images for several chapters.[12] He is aware that Peter of Abano favored them and that Aquinas denied their efficacy. His own attitude towards them is hesitant. He doubts if they have any power over a distant object, or even as much effect as some pretend upon the person carrying them. Yet past authority weighs much with him, and he concludes that with the aid of love and faith they may prove efficacious. But he puts medicines far ahead of images in efficacy and states that he employs medicines tempered to the sky rather than images.[13] Yet he seems to take a suspiciously keen interest in the images. Next he treats of the virtue of words and song to capture celestial benefits, and states that we may accommodate ourselves to the celestial harmony in seven ways: namely, by images, by medicines, by song, by odors and vapors, by imagination, reason, and quiet contemplation.[14] To live and act successfully one should learn what one's horoscope and astrological endowments are, and where they may be most favorably exercised, and then follow one's natural bent.[15] Astronomy should be our guide in procreation of offspring, in preparation of banquets, in building and clothing.[16]

[9] See caps. 4 and 11.

[10] Caps. 9 and 10.

[11] Cap. 12.

[12] Caps. 13-20. Gaffarel, *Curiositez inouyes,* cap. VI, sect. 7, held that in cap. 13 Ficino incorrectly ascribed to the rabbis the view that the brazen serpent erected by Moses in the wilderness was a talisman to avert the influence of Mars and Scorpio, and the golden calf a talisman to receive the favor of the moon and Venus.

[13] Caps. 15 and 20.

[14] Caps. 21-22.

[15] Cap. 23.

[16] Cap. 24.

Ficino observed that special celestial phenomena had marked the death of Lorenzo de' Medici in 1492,[17] and makes playful yet credulous allusion to planetary influence in his correspondence.[18] Before turning to his letters in detail, however, we may note his sermon on the star which led the Magi to Christ.[19] It is a strange sermon indeed and sounds much more like a dissertation. Ficino holds that the star of the Magi was a comet, from which the oriental astronomers by astrological rules were able to judge that a king was born who would reform the world with marvelous authority. He also speculates as to what the position of the planets must have been at the time of this comet. But when later the comet showed itself in the lower air and led them to Jerusalem, they knew that the king would not be human but divine, because the action and movement of the comet was not natural. Indeed, it probably was an angel. Thus Ficino tries to follow and satisfy both the astrological and theological interpretations of the star of Bethlehem.

Ficino felt that an especially close bond existed between Pico della Mirandola and himself, because they had both been born under the planet Saturn in the sign Aquarius, the one thirty years later than the other. Moreover, Pico was born in the same year that Ficino began his Platonic studies under the celestial inspiration of Cosimo de' Medici, and Pico came to Florence on the very day and almost the exact hour that Ficino published his edition of Plato and urged him to translate Plotinus, thereby voicing a wish of the late Cosimo de' Medici which had remained unknown to Ficino and was inspired in Pico from above.[20] Ficino is said by Massetani to have predicted to Giovanni de' Medici from the stars that he would become pope, but the passage to which he refers is not astrological.[21]

There are two sides or faces to the attitude to astrology dis-

[17] See the preface to Piero de' Medici following that to Lorenzo in his commentary on Plotinus (*Opera*, II, 1528).
[18] *Opera*, I, 726.
[19] *De stella magorum cuius ductu pervenerunt ad Christum regem Israelis iam natum*, *Opera*, I, 489-491.
[20] G. Massetani, *La filosofia cabbalistica di Giovanni Pico*, Empoli, 1897, pp. 29-30, quoting Ficino, *Praef. in versionem Plotini*.
[21] Massetani (1897), p. 175.

played by Ficino in his letters, although perhaps they are not so inconsistent or opposing as at first might seem. On the one hand he is continually assuming the influence of the planets upon himself or his correspondents. Sometimes this may be mingled with playful badinage upon his part, as when, returning a book on the stars late to its owner, Antonio Benivieni, he asks him to blame the stars rather than himself for this tardiness.[22] But it is so frequently reiterated that it soon ceases to be a laughing matter. It must be recognized as a constant factor and permanent habit in his thought which however tiresome it may become to the reader of the present day, seems never to have palled upon Ficino himself or the recipients of his letters.

The natures and qualities of the planets or their relations to one another are frequently remarked either for purposes of illustrating some other point or for their own sake. Thus in a letter to Bembo Ficino favors mixing the agreeable with the useful, as heavy and light mingle in nature or as Saturn concords with Mercury and Jupiter with Venus.[23] Or he tells Philip Carducci that Mercury and Saturn are alike in certain respects[24] or discusses pairs of planets with Martin Uranius.[25]

Sometimes Ficino did not even hesitate to ascribe evil effects and influences to the planets. Not only would he blame them for his slowness in returning a borrowed volume, but speak of Mars and Saturn as those planets which assiduously plotted perils for mankind.[26] But when he wrote to John Calvacanti that he thought Jupiter in Pisces benign to Calvacanti but Saturn, retrograde in Leo, malign to himself, Calvacanti reproved him for terming Saturn malign which had bestowed so many gifts on him, while the letter is headed, "Evils come not from the stars themselves but from a defect either of matter or of counsel."[27] Ficino accepted the reproof but replied with further astrological detail.[28]

[22] *Epistolae*, liber V, edition of 1497, fol. 134v.
[23] *Ibid.*, liber V, fols. 132v-133r.
[24] *Ibid.*, liber XII, fol. 232v, letter of 14 November 1492.
[25] *Ibid.*, fol. 233r.
[26] *Ibid.*, liber VI, fol. 146v, in "Oraculum Alphonsi regis ad regem Ferdinandum inter illos primum angelica lingua pronunciatum deinde vero in linguam humanam a Marsilio Ficino translatum."
[27] *Ibid.*, liber III, fol. 86v.
[28] *Ibid.*, fol. 87r-v.

The doctrine of nativities found large acceptance with Ficino. Frequently he alludes to Saturn as his own ruling planet,[29] and John Calvacanti assured him that it had made him surpass other men as it surpasses other planets.[30] John of Pannonia wrote Ficino that, when he years before visited Italy to study Latin and Greek literature, two astrologers predicted from the constellations that Ficino would renew the opinions of the ancient philosophers and Orphism. Ficino in his reply details the constellation referred to but insists that it only signified and did not cause his studies.[31] Ficino revealed fully and as precisely as possible his own nativity to Martinus Uranius at the latter's request.[32] Or he referred to the part played by the planet Jupiter and sign Cancer in the nativity of the archbishop of Florence.[33] Pico, like Ficino, was Saturn's child[34] but is also said to have been endowed by Mercury, Jupiter, and the sun with triple abilities.[35]

Other passages show that Ficino both accepted and practiced the department of astrology known as elections or selection of favorable times for initiating action and shunning of unfavorable seasons. If he has failed to call upon the archbishop of Florence[36] or Pico della Mirandola, it is because he found the constellations for the moment unfavorable.[37] Salviati showed more courage, if less discretion, and went ahead with an expedition, although Saturn was retrograde and hence forbade the enterprise.[38] Reading the works of Arnald of Villanova stimulated Ficino to composition of a treatise on deferring old age, but he took the precaution to start writing it under a favorable constellation,[39] realizing, he states, that the task would exceed mere earthly powers. Or he warns Lorenzo de' Medici that today and to-

[29] *Ibid.*, fol. 192r-v.
[30] *Ibid.*, liber III, fol. 87r.
[31] *Ibid.*, liber VIII, fols. 181r-182r.
[32] *Ibid.*, liber X, fol. 201r.
[33] *Ibid.*, liber X, fol. 207v, letter of 26 June, 1490.
[34] *Ibid.*, fol. 197r-v.
[35] *Ibid.*, liber VIII, fol. 194r.
[36] *Epistolae*, liber III, ed. of 1497, fol. 83r. The archbishop was Rainaldo Orsini.
[37] *Ibid.*, VIII, ed. of 1497, fol. 193r-v, letter of 3 July 1488.
[38] *Ibid.*, fol. 193v, letter of 6 July, 1488.
[39] *Ibid.*, liber IX, fol. 200, verso, letter of 23 August 1489 to Pico della Mirandola.

morrow he must beware of the planets Mars and Saturn, adding that he has put off telling him until the last moment, lest Lorenzo incur or increase the ills by mere anticipation.[40]

In one of his letters to the archbishop of Florence, as well as in his *Apology*, Ficino recognized that someone might deride him, a priest, for observing astrology, but he justified himself on the ground that among the ancient Persians, Egyptians, and Chaldeans such celestial matters were regarded as the appropriate concern of the priesthood.[41] Ficino thus was conscious of a certain antithesis, at least in some minds, between the Christian religion and astrology. In a letter written on Epiphany to duke Frederick of Urbino he is led on this anniversary of the three Magi and the star of Bethlehem to consider how to reconcile legitimate astrologers and Christians.[42]

Ficino was not content with the part either of an adherent of astrology or of a reconciler of it with the Christian faith. He also more than once assumed the rôle of an opponent of astrology. He writes to Bembo that he is composing a book on divine providence and human free will in which he assails those judgments of astrologers which detract from providence or freedom. More than that, he adds the gibe that idle astrologers lie about human affairs as extensively as true astronomers measure the heavens.[43] He sends Franciscus Nyppolitus Gazoltus the proemium of a work—probably the same as that just mentioned —which he is writing against the vain judgments of astrologers in which he combats the threefold error of those who say that particular events are produced necessarily by the stars—threefold because they deprive God of providence, deny the angels that move the spheres justice, and rob man of liberty of action. They predict with such loquacity and voluminousness that it is no marvel if amidst so many false forecasts they sometimes hit upon the truth. Despite their supposed ability to foresee

[40] *Ibid.*, liber VI, fol. 154v, letter of 26 September 1480.
[41] *Ibid.*, liber III, fol. 83r.
[42] *Ibid.*, liber VII, fol. 166v.
[43] *Ibid.*, liber IV, fol. 113r-v. The point of the gibe lies in a pun on the Latin words for "measure" and "lie": "Nempe quam diligenter coelestia vere metiuntur astronomi tam multum circa humana inanes astrologi mentiuntur."

the future they themselves remain poor, sordid, and unfortunate, and make a failure of business or medicine if they engage in either.[44] Ficino likes to compare them to the giants who of old tried to scale the heavens and war against divinity.[45]

But so long as astrologers did not maintain the doctrine of fatal necessity to the prejudice of divine providence and human freedom—and as a matter of fact very few at that time did so outright—Ficino would have little ground for quarrel with them. Indeed, he wrote Lorenzo Junior a letter "on the fatal prosperity which we often acquire from the stars outside ourselves and also of the free felicity which we gain at will from the stars within us."[46] And in his discussion to Frederick of Urbino on religion and astrology he affirms that no astrologer holds that religion is a product of the stars.[47] Such events as the birth of Christ and origin of Christianity could be forecast by the stars only as signs, not as causes, while the eclipse at the crucifixion was miraculous. Ficino would also make the stars merely signs and not causes of evil, of the fate of parents and brothers in nativities, and in interrogations concerning past events.[48]

In commenting on the *Enneads* of Plotinus, Ficino, while reinforcing his author's ascription of occult virtue to the stars, had also added further arguments to the brief chapter in which Plotinus questioned the astrological doctrine of aspects. Morinus, writing in the seventeenth century, charged Ficino with inconsistency in this, on the ground that in his pest tract of 1481 in Italian he had attributed the recent epidemic of 1478-1479 to the planets, Saturn and Mars, and their unfortunate aspects.[49] An examination of the pest tract shows, however, that this criti-

[44] *Ibid.*, liber IV, fols. 120v-121r.

[45] He makes this comparison not only in the passage which had just been cited but also in his letter of 20 August 1494 to Politian, liber XII, fol. 238v.

[46] *Ibid.*, liber V, fol. 137v.

[47] *Ibid.*, liber VII, fol. 166v.

[48] *Ibid.*, fol. 168r.

[49] J. B. Morinus, *Astrologia Gallica*, 1661, p. 373, col. 2. He adds that in the *Liber de vita coelitus comparanda* Ficino so immersed himself in astrology that he even admitted all the superstitions and nonsense of the Arabs. Morinus cites and quotes other passages from the commentary on the *Enneads* at pp. 468-469.

cism was not quite fair to Ficino, since he ascribes the recent pestilence to eclipses and to the conjunction of Mars and Saturn in the human signs rather than to their aspects. This consideration comes in only when he warns men to be on their guard when the moon is in conjunction or opposition with the sun, when it is in conjunction with Saturn or Mars, and *when it is in quadrate aspect with the said planets*. He further advises that persons fleeing from the pest go to a city or castle with a different ascendent from the stricken community which they are abandoning. Thus the particular doctrine of aspects plays a minor rôle, but his astrology in general is sufficiently extreme. And in his letters he accepted evil aspects of the planets. There were, however, other signs preceding this recent pest than in the constellations. In the year 1477 the relics of St. Peter the apostle newly found in Volterra manifested to the people within the space of one month ten stupendous miracles, and Ficino predicted to many Florentines in consequence that great tribulations of war and pest were at hand. One of the most ferocious wars that ever were broke out in the following April, and in August began an attack of the pest such as there had not been for over a century.[50]

In a letter of about 1492 Pico della Mirandola declares that there was no one who exhorted him more often or efficaciously to uncover the fallacy of astrology[51] than Ficino. In a passage of his elaborate work against astrology Pico again gives the impression that Ficino had urged him on to its composition. In a sense this was probably true, for we have seen that Ficino himself had written a treatise against astrologers. Pico adds that when Ficino and he joked together, nothing was more often the butt of their wit than the vanity of astrologers, especially if Politian was with

[50] There are several editions of Ficino's pest tract or *Consiglio contro la pestilenzia*. The first was at Florence, St. Jacobus de Ripolis, 1481, 52 fols. Hain 7082. Others at Florence were of 1522 and 1576. I have seen the last named and also an edition of 56 fols. without date or place of publication at the Academy of Medicine, New York: *Conseglio di Marsilio Ficino Fiorentino contro la pestilentia* (illustrated title page). The astrological passages noted occur in caps. 2, 6, and 23.

[51] Cited by Soldati (1906), p. 212 from *Opera*, Basel, 1601, p. 281.

them.[52] Pico was too much inclined to represent persons as on his side of the argument who were in reality favorable to astrology. That this was the case with Ficino our brief analysis of his writings has sufficed to show. He may have laughed at the errors of too presumptuous astrologers or of mere charlatans, but he took astrology itself very seriously, as we have seen. Ficino himself nevertheless was to lend further color to Pico's implication that he agreed with Pico's attack on astrology.

In a letter of August twentieth, 1494, to Politian[53] Ficino attempted to explain and justify his somewhat double-faced attitude to astrology. He regarded himself as in essential agreement with Pico and Politian whom he represents as having long since been accustomed to pursue these prodigies of the astrologers sharply everywhere like other monstrosities. As for Ficino himself in the past, he rather naïvely admits that in his commentaries on Plotinus he had joined in that author's ridicule of astrological images and of many of the rules of astrology, but in his book *De vita,* writing as a member of the medical profession, he had felt obliged to list some of the images on the chance that they might benefit some persons, "nor do I despise images utterly nor reject all rules" of astrology. Yet he rejoices that Pico in his *Disputations against astrology* has exploded astrological portents, whatever he may mean by that word.

The fact that a person so saturated with astrological ideas and technique as Ficino should thus cheerfully subscribe to Pico's attack upon astrology and see nothing in it at variance with his own previous astrological theory and practice warns us not to take that attack or its influence on others too seriously. Perhaps even Pico himself still believed in nearly as large a measure of

[52] *Disputationes adversus astrologiam,* liber I, p. 418 in the Basel, 1572, edition of Pico's works. Pusino's misinterpretation of the passage in his "Ficinos und Picos religiös-philosophische Anschauungen," *Zeitschrift für Kirchengeschichte,* XLIV (1925), 506-507, and the same mistake in Arthur Liebert, *Giovanni Pico della Mirandola: Ausgewählte Schriften,* 1905, pp. 248-249, were corrected by me in *Zeitschrift für Kirchengeschichte,* XLVI (1927), 584-585, "Marsilio Ficino und Pico della Mirandola und die Astrologie."

[53] *Epistolae,* liber XII, ed. of 1497, fols. 238v-239r.

astrology as Ficino. However, in Pico's case we have more reason to suppose a certain change of attitude than we have in the case of Ficino. There is no reason for assuming that the latter underwent any sudden conversion as a result of the appearance of Pico's volume. He had written treatises himself against astrology a decade or more earlier and not improbably had given Pico the idea of doing the same on a more elaborate scale. Yet at the same time Ficino had been cherishing astrological ideas, as we should call them, and even practicing them. The same condition doubtless continued to be true of many who did lip-service to Pico's criticism of the art but whose minds would still work in the old astrological tracks and ruts.

An alchemical treatise printed under the name of Ficino[54] is probably spurious. Its twentieth and last chapter adds a necromantic touch by giving questions put by a necromancer named Illardus to the devil concerning the philosophers' stone.[55]

[54] Manget, II, 172-183: Marsilii Ficini Florentini liber de arte chimica, opening, "Omnium recte philosophantium eadem est opinio. . . ."

[55] See also BM Sloane 1073, end of 16th century, fol. 3, Dialogus inter Hilardum necromanticum et quendam spiritum; and Sloane 118, end of 15th century, fol. 82v, Answers to certain questions asked of the devil by "a certaine nigromancer named Elardus in the province of Cattalonia."

CHAPTER LXIV

JEROME TORRELLA ON ASTROLOGICAL IMAGES

A cap and climax was put to the many discussions of astrological images during the middle ages by a long treatise on that subject by Jerome, Girolamo, or Hieronymus Torrella which was composed, corrected, and printed at Valencia in 1496,[1] and dedicated to king Ferdinand of Aragon. In this dedication Torrella speaks of himself as personal physician to Ferdinand's sister, the queen of Naples.[2] Jerome's two brothers were also "most learned doctors of medicine," one at Celleritana in Sardinia, the other at Rome where he had become a bishop and personal physician to pope Alexander VI. This was Gaspar Torrella,[3] from whose pen there are extant an astrological judgment originally written for Caesar Borgia but not printed until 1507,[4] a discussion of syphilis which has been called the most valuable of ten such appearing during the years 1496-1498, and other medical works.[5] He also became physician to the next pope, Julius II. Schenck ascribed to Gaspar a *De magica medicina* without mentioning the date or place of publication and Marini

[1] Hieronymus Torrella, *Opus praeclarum de imaginibus astrologicis,* Valentiae, Alphonsus de Orta, 1496: Hain 15560; BM IA. 52083. Fol. h.v, verso, "Nos etiam in festo corporis Christi anno MCCCCLXXXXVI in quo iam hunc libellum compositum castigabamus et per totum annum bene castigatum fore speramus . . . in hac nostra civitate Valentina. . . ."

[2] *Ibid.,* fol. a.iii, recto.

[3] *Ibid.,* fol. e.i, verso, "Duos certe germanos in medicina doctores habeo atque doctissimos sub praefatis constellationibus natos quorum unus apud insulam sardiniae in civitate calleritana vitam degit, alter vero rome domicilium habet episcopus et summi pontificis Alexandri sexti Roderici de borga medicus comensalis vir certe omni saeculo venerandus ac bene in medicina fortunatus."

[4] *Iudicium universale de portentis presagiis et ostentis rerumque admirabilium ac solis et lunae defectibus et cometis,* Romae per Iohannem Besicken, 1507.

[5] Such as a *Consilium de egritudine pestifera et contagiosa Ovina cognominata nuper cognita quam Hispani Modorillam vocant,* etc. Rome per Ioannem Besicken Alemanum, 1505. In it Gaspar refers to a *Consilium* on the pest which he had produced the previous year and to two previous tracts on syphilis by himself. For his works on syphilis see Hain 15557-15559.

could find no such work.[6] The father of Jerome and Gaspar Torrella had attended the university of Montpellier and had been, according to his son, a most famous medical man and mathematician.[7]

Jerome Torrella alludes a number of times to his residence formerly in Italy[8] and especially to the master under whom he had studied medicine there, Peter Leo of Spoleto.[9] Torrella was at Rome in 1474.[10] When eighteen he had disputed with a theologian at Siena as to the power of human imagination.[11] He received the doctorate in arts and medicine in Italy at the age of twenty,[12] on which occasion he took both sides as to the present question of the validity of astrological images. When he reached the age of thirty he found that eating certain kinds of fish which had not troubled him before now produced dire results.[13] He had also been at Bologna, where Girolamo Manfredi had given him a work on astrological images ascribed to Hermes.[14]

Jerome had written other works than this present one and had the composition of yet others in prospect. He planned to reply to Pico della Mirandola's work against astrology, and appears to have already written a commentary on the first fen of the first part of the *Canon* of Avicenna and the *Tegni* of Galen, and a treatise on the intelligences that move the spheres. He had composed an opusculum of six questions entitled *Enucleatum,*[15] and a treatise on tides in which he flattered himself that he had discussed that matter more clearly than Peter of

[6] G. L. Marini, *Degli archiatri pontificii,* I (1784), 280.

[7] *De imaginibus astrologicis,* 1496, fol. l.iiii, recto.

[8] *Ibid.,* fol. d.vii, verso, "dum apud Italiam vitam degeremus": fol. e.vi, verso, "Nos quidem dum sustentaremus in Italia. . . ."

[9] Fol. b.i, recto, "et reverendus magister Petrus Leo praeceptor meus . . ."; fol. e.i, recto, "preceptor meus magister Petrus Leo Spoletinus medicinae professor."

[10] Fol. b.i, verso.

[11] Fol. l.vi, verso.

[12] Fol. f.v, verso, "Et dum apud Italiam vitam degeremus et annum nati fuissemus vigesimum in quo anno insignia doctoratus artium et medicinae accepimus. . . ."

[13] Fol. i.i, verso.

[14] Fol. m.ii, recto.

[15] Fols. e.iii, recto; e.vi, recto; f.vi, recto; h.vi, recto; i.v, recto; l.vi, recto; l.i, recto, l.ii, recto.

Abano had done in the 168th Differentia of the *Conciliator*.[16] In yet another treatise he had discussed both sides of the question whether the heavens were moved by intelligences by intellect and will or by executive power distinct from intellect and will.[17]

At the beginning of his work Torrella lists forty-four authorities. Except perhaps in the case of a few recent professors and writers, he does not include names otherwise unknown but displays a fairly broad acquaintance with medieval scientific and medical literature. Among these less known recent writers or personages is a Philip of Sicily (*ciculus*) described as a follower of Albertus Magnus (*optimus Albertista*), a professor of sacred theology and a most learned theologian of Paris of the Dominican Order.[18] It is at the request of a John Scriva that Torrella repeats the astrological images of a work ascribed to Hermes.[19] And from Alexander of Sarmoneta, the most noted physician, Torrella had often heard how his father, John of Sarmoneta, was cured of severe intestinal pains by using the figure of a lion engraved under a certain constellation.[20] So little attention did the medical profession pay to Gerson's censure of the physician of Montpellier! While in Rome in 1474 Torrella had been freed from the pains of gout by a seal of fish originated by a Bartholomew Gerp and had cured a third person with a similar seal which he himself constructed.[21] The same Gerp is later cited at length as to the astrological prospect of a speedy end of Moorish dominion and of Islam.[22] Of this Bartholomew Gerp's disputation at Bologna in 1471 we have spoken in another chapter.

Roger Bacon is cited several times "in the letter on the causes of ignorance to pope Clement," which is Torrella's designation for the *Opus Maius*,[23] and "in the book on art and nature,"

[16] Fol. k.vii, recto.
[17] Fol. e.vi, recto. Or possibly this is identical with the treatise on the intelligences that move the spheres already cited.
[18] Fol. l.iii, recto; fol. f.iii, verso.
[19] Fol. m.ii, recto.
[20] Fol. b.i, recto.
[21] Fol. b.i, verso.
[22] Fol. d.viii, recto, ". . . astrologice et non theologice loquendo."
[23] Fol. a.v, recto, "Hoc etiam in epistola de causis ignorantiae ad papam Clementem refert Rogerius Baco"; fol. k.iiii, recto, "Rogerius etiam Baco in epistola de causis ignorantie ad papam Clementem quartum intitulata."

that is to say, the treatise on the secret works of art and nature and nullity of magic.[24] Even king Ferdinand is represented as saying that he has heard of Roger Bacon's utterances on the relation between conjunctions of the planets and religious sects.[25] Such medical works and writers of the thirteenth, fourteenth and fifteenth centuries as the *Summa Anglicana* of Gilbert of England,[26] Bernard Gordon,[27] Peter of Abano,[28] Valescus de Taranta,[29] and the Franciscan, Jean Ganivet, author of the *Amicus Medicorum*,[30] are cited in support of astrological medicine, if not of astrological images. The *Historia Scholastica* of Petrus Comestor and Albertus Magnus's work on minerals are cited for the assertion that Moses engraved a ring of memory and another of forgetfulness.[31] Raymond Lull, author of the art named after him, is not forgotten by Torrella[32] and is said to have held that the planets and signs were not moved by angels but naturally by their substantial forms. Nicholas of Lyra, the fourteenth century biblical expositor, is represented as accepting the influence of the stars upon the body, sense appetites, and the passions.[33] Duns Scotus, the great scholastic philosopher, is said to have defined good fortune as a quality produced by the heavenly constellations in sense appetite moving it to do something from which good follows without its perceiving the good or the reason of such movement. Scotus further believed, Torrella states, that such a quality inclining sense appetite to pursue some advantage could be impressed in an image or seal manufactured artificially.[34] Giovanni Marliani, "the most outstanding mathematician of our time," was, Torrella had heard

[24] Fol. a.vi, "in libro etiam de arte et natura Rogerius Baco in omni genere doctrinae praestantissimus."
[25] Fol. d.v, verso.
[26] Fol. b.i, verso.
[27] Fol. h.ii, verso.
[28] Fol. a.v, recto, "Legat maiestas tua invictissima Consiliatorem magnum differentia decima dicentem. . . ." See also fols. k.vii, verso, l.iiii, verso.
[29] *Idem*, "Valescus de Taranta 6° sue practicae libro capitulo de guta."
[30] Fol. h.iii, r-v, "ex sententia Ioannis Ganiveti ordinis fratrum minorum sacre theologie professoris in libro intitulato *Amicus Medicorum* differentia iii cap. primo. . ."
[31] Fol. a.v, recto.
[32] Fol. e.vi, recto.
[33] Fol. i.viii, verso; see also fol. k.i, recto.
[34] Fol. e.i, verso; e.ii, recto.

from a physician of Venice, cured of fear of thunder storms by an image of a lion engraved in gold when the sun was in conjunction with Jupiter.[35] The most prominent living author to be cited is the Patriarch, Francesco Ximenes of Aragon, whose book against John of Lübeck on the time of the coming of antichrist is mentioned.[36]

Such Latin astrological writers are used as Guido Bonatti of Forlì in the thirteenth century[37] and John of Saxony commenting on Alcabitius in the fourteenth,[38] while Girolamo Manfredi is mentioned as a contemporary.[39] Cardinal Pierre d'Ailly is quoted approvingly as a supporter of nativities, revolutions of the year, and astrological weather prediction.[40] On the other hand, Torrella is well aware that d'Ailly's disciple and successor, Jean Gerson, had published a treatise on December eighth, 1428, against a physician of Montpellier who had used a sculptured figure of a lion to cure intestinal complaints, and that more recently in 1482 Bernard Basin had denied that anyone was cured of trouble with the bowels by such an image. Torrella possessed printed copies of both works.[41]

But the divergence of views on astrology between d'Ailly and Gerson is a matter of less concern to our author, or at least is less dwelt upon by him, than is that between Albertus Magnus and Thomas Aquinas, some two centuries before. Albert is recognized as being in agreement with the astrologers[42] and favorable to purely astrological images. Torrella also unquestioningly accepts Albert as the author of the *Speculum astronomiae,*[43] which he calls *Mirror of the Sciences* rather than of astronomy and

[35] Fol. b.i, recto.
[36] Fol. d.viii, verso; see also d.v, verso.
[37] Fol. k.v, verso.
[38] Fol. a.vii, verso-viii, recto, "Legatur preterea Iohannes de Xaxonia (*sic*) super alcabicium. . . ."
[39] Fol. m.ii, recto.
[40] Fols. k.iii, recto-k.iiii, recto.
[41] Fol. c.iiii, recto, ". . . et isti libelli impressi ad manus meas pervenerunt."
[42] Having given a number of arguments and authorities against judicial astrology, Torrella proceeds, fol. g.v, verso, to give the replies "quas Albertus Magnus et astrologi in medium adducerent." Already he had made a great deal of use of Albert's arguments, however.
[43] Fol. a.viii, verso, "Et si legit celsitudo tua Albertum Magnum in speculo scientiarum." Albert's authorship seems certain despite Mandonnet's attempt to question it.

repeatedly cites in support of astrological images, sometimes under the alternative title, "Of things eligible and to be shunned in astronomy."[44] He repeats a chapter of it on the ground that copies of the *Speculum* itself might not be accessible to his readers.[45]

While Aquinas was in general as favorable to astrological influence and judgments as Albert, he was distinctly less so to astrological images, holding that mere images or diagrams could not receive, store up, and transmit the natural force of the stars.[46] Torrella at first seems to try to obscure this fact and to give the impression that Aquinas regarded such images as efficacious astrologically. This is done by citing two opuscula of doubtful authenticity, the *De fato* and *De esse et essentiis*.[47] The fourth article of *De fato* is quoted to the effect that the constellations control not only natural objects but also artificial, and therefore images are fabricated under certain constellations.[48] In *De esse et essentiis* it is written that such images are not superstitions but have, impressed by the heavenly bodies, a quality productive of many marvelous effects. This quality comes from the angel moving and directing the heavenly bodies and not by virtue of their substantial form, and those effects transcend the virtues of the elements or their compounds.[49] Later, however, Torrella notes that in the opusculum *De occultis operibus* Aquinas calls all images superstitious, whether made under certain constellations or not, and suggests that, inasmuch as they were called magical in *De fato,* they have their virtue partly from

[44] Fol. b.iiii, recto, ". . . in libro de aeligibilibus et fugibilibus astrologicae nominato speculum scientiarum"; fol. k.iiii, recto, "una cum Alberto Magno in libello de fugibilibus eligibilibusque astronomie qui vocatur Speculum."
[45] Fol. d.v, recto.
[46] *Magic and Experimental Science,* II, 610.
[47] Torrella seems to entertain no doubts as to the genuineness of *De fato,* but as to the other remarks, fol. e.v, recto, "Dici potest beatum Thomam si istum librum edidisse quod si ipsum non composuit, ut quidam asserunt theologi nostri temporis, saltem Thomas est nomen eius a quo editus est libellus prefatus."
[48] Fol. e.iii, verso, "In libro etiam de fato articulo quarto ait sanctus doctor constellationes dare ordinem essendi atque perdurandi non solum rebus naturalibus sed etiam artificiosis, ideo imagines sub certis constellationibus fabricari." Later at fol. e.vi, recto, Torrella quotes the exact words of the passage in question.
[49] Fol. e.iiii, verso-e.v, recto.

evil spirits and only partly from the heavens.[50] Torrella furthermore now correctly sets forth the view of Aquinas as to figures and images, as it has been already briefly summarized at the beginning of this paragraph. He also makes it clear that the *Albertistae* or followers of Albertus Magnus and the Thomists or followers of Aquinas[51] constitute two opposing parties and schools of opinion upon this question of the efficacy of astrological images. He himself, when in Italy, often sustained the part opposed to the opinion of Albertus. The followers of Albert hold that the "magic images" of *De fato* are purely astrological and belong only to natural magic, not to diabolical magic.[52] A Thomist might admit that gold fused in a certain constellation received power of curing the intestines, and this through the action of the parts of the gold on one another, but would deny that the figure of a lion in which the gold was engraved had any influence in this. The Albertists, on the other hand, would hold that the figure of the lion supplemented and perfected the reception by the gold of virtue from the constellations.[53]

Sometimes Torrella's references are vague, as when he cites "a little book published in Spain" for a list of countries subject to the sign of Cancer.[54] Sometimes they allude to apocryphal mystic writings such as "a most ancient book written by Abel, son of Adam,"[55] who sealed it up in a stone where after the flood it was discovered by Hermes.

Torrella's treatise is long, disorderly in arrangement, and repetitious. Throughout it the general question of the validity of astrological images, which Torrella argues both pro and con but evidently with a sneaking preference for such images, is joined with the particular and, as it were, test case of an image of a lion carved in gold under a certain constellation and said to possess the power to cure intestinal pains (appendicitis?) and to work other marvels. This was the type of image which Peter

[50] Fol. e.vi, verso.
[51] Fol. e.vii, recto, "Haec Thomas Aquinates ex qua autoritate arbitrantur Thomistae nonnulli omnem sculpturam secundum eum superstitiosam esse, licet sub certis constellationibus fiat."
[52] Fol. e.viii, recto.
[53] Fol. i.i, verso.
[54] Fol. d.vii, verso.
[55] Fol. e.v, recto.

of Abano professed to have found efficacious and for using which Gerson had censured the physician of Montpellier. Torrella reverts to it again and again as the main bone of contention in his treatise. On the whole Torrella tends to retain for astrological images a certain power, limited chiefly to medical and imaginary effects, but to disallow many exaggerated claims which had been made for such images by past authors. He agrees with Aquinas that if images speak or move, such unnatural marvels are to be ascribed to demons.[56] He further doubts whether an astrologer can determine the duration of the effect of an astrological image.[57] Whether writing the names of the angels who move or rule the planets upon such images makes them more efficacious he discreetly leaves to the theologians.[58] He also notes that a most learned theologian[59] had doubted whether a person dumb from birth could talk by holding such an image on his tongue, or whether learning could be acquired by such methods. Torrella agrees that there is no such force from the stars and that hence images for which such extreme claims are made are superstitious, diabolical, and forbidden to Christians.[60]

Torrella calls king Ferdinand's attention to the account, which we have noted in another chapter, from *De essentiis* of an image which prevented horses from going by and disturbing the sleeper.[61] Moreover Torrella's father, while studying medicine at Montpellier, had seen sufferers cured of gout and intestinal pains by a learned physician and astrologer who resided there by means of a fish and lion fabricated of gold in a purely astrological way.[62]

The occult properties of medicine and especially of the magnet which he states in an exaggerated form[63] encourage our author to accept the powers claimed for astrological images. A good brief example of his faith in far-fetched methods of cure by other means than images is afforded by his statement that quinsy

[56] Fol. e.iii, verso.
[57] Fol. l.i, recto.
[58] Fol. e.v, verso.
[59] Possibly to be identified with the Philip of Sicily who is mentioned on the page following, possibly with William of Auvergne, bishop of Paris.
[60] Fol. f.iii, recto-verso.
[61] Fol. e.v, recto.
[62] Fol. l.iiii, recto.
[63] Fol. i.ii, verso.

sore throat is cured by the thread with which a viper has been choked.[64]

Torrella attempted to argue the question of astrological images in the approved scholastic style with delicately drawn and subtle distinctions. In such a gold image of a lion there is very likely no change of substance or from species to species, but there is acquired an accidental specific form and new force, or else some dormant and latent power is excited into actuality by the influence of the celestial bodies and art.[65] The followers of Albertus believe that in addition to natural virtues, which go with the substantial form of anything, there are artificial forces joined to artificial forms as in images.[66] In the moot case of the image of the lion made of gold, it is not the mere figure of the image which is efficacious—Aquinas having denied any operative force to mere mathematical diagrams or written characters—but the gold existing in the accidental specific form of the lion as shaped under certain constellations.[67] This power implanted by the heavens in something shaped by art is not a substance but rather an accident or a quality. This quality is active not passive and is introduced immediately after the making of the image.[68] This quality is half way between corporal and spiritual qualities.[69] It ceases if any part of the lion is broken off.[70]

Although it seems clear that Torrella at the bottom of his heart wanted to believe in images, and although he advances both experiences and subtle reasonings in their favor, he does not quite convince even himself or at least is not bold enough to declare unqualifiedly in their favor. Towards the close of his treatise he comes to the following rather lame conclusion. While in his youthful and callow days he had accepted the position of Albertus Magnus and the astrologers, now he will not venture to determine what should be held but will leave this decision to the theologians.[71]

[64] Fol. i.iii, recto.
[65] Fol. i.iii, recto.
[66] Fols. e.viii, verso-f.i, recto.
[67] Fols. f.ii, verso-f.iii, recto.
[68] Fol. f.v, verso.
[69] Fol. f.viii, verso.
[70] Fol. g.i, verso.
[71] Fol. l.iiii, recto. "Ideo dum paucos annos atque indigestos nati essemus credebamus dictis Alberti Magni aliorumque astrologorum. Nunc vero quid tenendum sit nequaquam nos determinamus sed theologis relinquatur."

Torrella's treatise has much to say of astrology apart from images. The old arguments for and against the art of judicial astrology are reviewed. Many details of astrological technique are set forth.[72] Torrella's faith in astrological medicine is well brought out by the following passage which he asks the king to note especially as attested by experience.[73] One man fell sick at a certain hour of the day of a certain type of cholera when the sixth house, which signifies sickness, coincided with a fixed sign and the moon also was in a fixed sign. His illness was of long duration. On the very same day but at a different hour another man of like physical constitution (*complexio*) fell sick of the same fever. But since the sixth house was then a mobile sign and the moon also was traversing a mobile sign, his sickness was short. At yet another hour of another day Torrella had seen a third person grow ill and pass from one disease to another, because the moon was in a common sign, and the sixth house was a common sign. He also had seen a man fall sick after a conjunction of sun and moon when the sixth house was a fixed sign and the moon was in the same, and the disease was very prolonged. But after an opposition of sun and moon, with the latter in a mobile sign, the illness was brief.

Torrella believes that different persons have differing natural aptitudes according to their nativities. He cites Aquinas[74] that it is by the virtue of the sky that some are skilled in certain arts.[75] A prince should choose a physician with a favorable horoscope. Venus should be in conjunction with Mars at his nativity, or one or both of these planets should occupy the house of Mars, or Mars should be in the sixth house. Both of Torrella's brothers were born under these constellations and are now learned medical men.[76] Those who can dream true dreams concerning the future likewise are born under certain constellations, as Jean

[72] See fols. f.iiii, recto-f.v, verso.
[73] Fol. k.vii, recto, "Et attendat bene excellentia tua nam istud experientia comprobatum est."
[74] Fol. e.i, recto, "tercio libro contra Gentiles cap. 82."
[75] *Idem*, "virtute caelesti fieri aliquos in quibusdam effectibus artium efficaces."
[76] *Ibid.*, fol. e.i, verso.

Ganivet had already recognized in his *Amicus medicorum*.[77] A relation between astrology and chiromancy is suggested in the affirmation that from the lines in a man's hand one can tell what planet he is under, a point which we have heard elaborated in the *Physiognomy* of Roland Scriptoris. Conversely Guido Bonatti set forth a person's inclination and physiognomy according to his nativity.[78]

The doctrine of conjunctions as well as nativities was accepted by Torrella. He states that persons who knew something about astrology were of the opinion that after the conjunction of the superior planets of 1464 Judaism would suffer great detriment, a prediction which Ferdinand and others had already done much to fulfill.[79] A conjunction of the three superior planets in 1503 in the belly of Cancer will work towards the same end, as a certain learned Italian astrologer had already set forth. In fact, there were to be a number of conjunctions in 1503-1504, and the opinion of astrologers, as Torrella had gathered while in Italy, was that changes of realms would follow in places governed by Cancer and Capricorn.[80] Ferdinand is represented as asking whether the effects of such conjunctions will follow them immediately, and is told that some will come to pass within a few years and others be prolonged for some time.[81] He also asks what kingdoms are subject to Cancer.

Albertus Magnus is represented as approving the art of geomancy with the following restrictions. He would classify as illicit and superstitious such practices as uttering prayers over the pen and ink employed in jotting down the lines of points, or doing this on a Wednesday, or, as some geomantic books instruct, only when the weather is fair. But if the dots were made without additional observances, he would not deem the procedure superstitious.[82]

While astrological methods of divining the future are those which are chiefly alluded to in our treatise, the prophecies of

[77] Fol. h.iii, recto-verso.
[78] Fol. k.v, verso.
[79] Fols. d.v, verso-vi, recto.
[80] Fol. d.vi, recto-verso.
[81] Fol. d.vii, verso.
[82] Fol. k.vi, recto.

hermits also receive some attention. Many of these had predicted that other religions would soon be converted to Catholic Christianity and have one pastor. Ferdinand is especially urged to read what a certain hermit of Constantinople had written in 1455 concerning the king of Valencia.[83] On the other hand, of the three questions which Ferdinand is represented as putting, the last is whether any living hermit or man of religion has predicted the recovery of the empire of Constantinople by Christian monarchs.[84] As Torrella was finishing his treatise, a Dominican friar from Italy was edifying Valencia by his ability to fall into trances.[85] The most Christian Patriarch, Francesco Ximenes, predicted the end of the Mohammedan religion and a great deal concerning the kingdom of Aragon.[86]

[83] Fol. d.vi, verso.
[84] Fol. d.vii, verso.
[85] Fol. h.v, verso.
[86] Fol. d.v, verso.

CHAPTER LXV

A PHYSICIAN OF FLORENCE: ANTONIO BENIVIENI

Antonio Benivieni of Florence, who lived from about 1440 to 1502, has been praised as a founder of pathological anatomy. His work, *On Some Hidden and Marvelous Causes of Sickness and Healing,* completed at some time between 1496 and the year of his death and first printed posthumously in 1506 at Florence and then repeatedly within the next few years at Venice, Naples, Paris, and Basel,[1] has been described as recording some two hundred autopsies.[2] On turning to the text itself, however, one finds only a small volume whose one hundred and eleven brief chapters comprise as many cases and far fewer post mortems. These accounts of clinical experiences merely continue the tradition long established by the more elaborate *Consilia* of physicians of the two preceding centuries. Benivieni has been called one of the first doctors who practiced surgery, but in neither field of medicine or surgery does he give such full and detailed accounts of his cases and method of treating them as do many earlier medical *consilia* or the personal reminiscences of a surgeon like Leonard of Bertipaglia.

Benivieni's autopsies, too, attest the fact that such dissection was a common practice rather than mark any new departure. Not merely was it his wont to dissect the corpses of criminals; he also, like his contemporary, Bernard Tornius,[3] performed

[1] I have used the edition of 1507: *Antonii Benivenii de abditis nonnullis ac mirandis morborum et sanationum causis,* Impressum Florentiae Anno ab incarnatione Dominica MCCCCCVII octavo Kalendas Octobris opera et impensa Philippi Giuntae Florentini. At fol. a.ii, is a letter of Hieronymus Benivenius, Antonio's brother, to Johannes Rosatus, opening, "Cum post insperatam amantissimi fratris mortem . . ." and at fol. a.iii, is Rosatus's reply. The first chapter of the text proper begins on a.iii, verso: "Novum morbi genus anno salutis nonagesimo sexto. . . ." Other editions are Venice, 1516; Naples, 1519; Paris, 1528; Basel, 1529; etc.

[2] Ernst Gurlt, *Geschichte der Chirurgie,* I (1898), 905-909.

[3] See my *Science and Thought in the Fifteenth Century,* 1929, Chapter VI, "A Fifteenth Century Autopsy."

autopsies to determine the cause of death, "making an incision," as he states in one place, "into the cadaver of the deceased for the sake of public utility."[4] So usual to all appearance was this procedure, so far was there from being any ecclesiastical prohibition or religious prejudice against it, that when in a certain case he wished to test by a post mortem whether death had been caused by closing of the smaller intestine, and the relations of the deceased refused permission, he said that he did not know what superstition dictated their refusal.[5]

It cannot be denied that Benivieni's little book makes interesting reading, as indeed it was probably intended to. As its title indicates, the marvelous, abnormal, and sensational are emphasized, and the author at times makes heavy demands upon our credulity. Following the initial chapter on the appearance of syphilis in Europe in 1496, the very next chapter tells of a patient's vomiting a worm four fingers long with a red head, a bifurcated tail like a new moon, and four legs. In another instance a friend of Benivieni escaped death by voiding a worm longer than a palm from his right nostril.[6] In the fourth chapter we read of a man who lost a pound of blood from his right side without any perceptible break in the skin or flesh. In the eighth chapter we encounter the case of a woman who, Benivieni is sure, must have been possessed by a demon, since she threw up long curved nails and copper needles with wax and hair mixed in a ball, and a piece of food of such magnitude that no one could have devoured it whole. After Benivieni had witnessed many such feats and had also heard her predict the future, he became convinced that some evil spirit was deceiving the spectators.

Indeed, Benivieni is both readier to accept supernatural explanations and more credulous and superstitious than had been many medieval medical writers. When as a schoolboy studying Greek he entered the church early one morning and saw flames

[4] *De abditis . . . causis,* cap. 36: "quare defuncti cadavere publicae utilitatis gratia inciso."

[5] *Ibid.,* cap. 32: "Sed nescio qua superstitione negantibus cognatis voti compotes fieri nequivimus."

[6] *Ibid.,* cap. 100.

rising from the pavement, he fled panic-stricken to his room where his chum was still in bed. Their teacher who had just risen explained that the phenomenon was produced by vapors from the bodies of the dead buried within the church which easily burst into flame on coming in contact with the hot July air. This explanation still satisfied Benivieni, but his fright at the time none the less gave him a fever.[7]

Benivieni resembles earlier writers of medical *consilia* in the tendency to present those cases in which the patient, after having failed to obtain relief from other physicians has come to him and been cured. But his work includes other classes of cures. Some persons recovered their health without medical aid by letting nature take its course. Others were healed by prayer, piety, the sign of the cross, or incantations of an *Ariolus*.[8] The verbal method seems to have been especially effective in cases where the barbs of arrows were stuck in the bone and would not come out. One such patient acquired a gift of prophesy after he began to pray for relief, but as soon as the barb came out, he lost his ability to predict. While Benivieni records with approval cures in which a monk and a Dominican made the sign of the cross, he objects to priests' practicing medicine and tells as a warning of the death of a man who went to such a priest.[9] No doubt his attitude is that the patient should first consult a properly trained physician and resort to members of the clergy only for supernatural aid, and that only after the physician has failed to give relief. Of medical treatments he devotes several chapters to diseases cured by blood-letting alone.[10]

The causes of death as well as of recovery interest Benivieni, as his post mortems have already made evident. Other examples are death as a result of applying a very cold plaster to the stomach—"for that worthy doctor did not know that no principal member or that subservient to it can be cured by cold remedies

[7] *Ibid.*, cap. 62.
[8] *Ibid.*, caps. 9, 10, 26, 45.
[9] *Ibid.*, cap. 73.
[10] *Ibid.*, cap. 44, "Ex tabe sanata sola sanguinis missione"; cap. 60, "Molesta tussis sola sanguinis missione curata"; cap. 75, "Iocinioris vitio laborans sola sanguinis missione sanatur."

alone"[11]—deaths from drinking too cold water after long exertion under a hot sun,[12] from excessive blood-letting,[13] from cutting the smaller intestine,[14] and from wind alone.[15]

If Benivieni believes in spirits and incantations and in ability to prophesy by pathological patients, he evinces little interest in astrology and alchemy. He is not an advocate of caustic waters, perhaps because he was more given to incision.[16] He tells, however, of an abscess opened by use of theriac alone.[17]

Along with such tales as we have heard from Benivieni there is doubtless not a little of value as well as of interest. The spread of syphilis is said to have been first from Spain to Italy and then to France.[18] Gallstones are described, but probably not for the first time, in the post mortem on a woman.[19] In the lower part of the membrane of the liver were crowded small stones of diverse shapes and colors, round, angular, square, and with red, blue, or white spots. Their weight distended the sac to a palm in length and two fingers in breadth. In his dissection of the corpses of criminals Benivieni attempted to discover physiological explanations for their persistence in crime despite repeated punishment, such as undevelopment of the back of the head where the seat of memory was located[20] or a heart filled with globules from its excessive heat. This last, however, he regarded as a sign of rare courage as well as of criminal perversity.[21] A faint adumbration of the present fashion of extracting the teeth to tone up the system is afforded by the cure of an ulcer of the chin by pulling the tooth "to whose roots the ulcer ascended."[22] Or there may be a suggestion of vitamins in the case of the sufferer from leprosy and fever who, after being reduced to nothing but skin and bones and despaired of, was cured by allowing him to eat what he pleased: namely, walnuts in the spring,

[11] *Ibid.*, cap. 15.
[12] *Ibid.*, caps. 16-17.
[13] *Ibid.*, cap. 50.
[14] *Ibid.*, cap. 76.
[15] *Ibid.*, cap. 81.
[16] *Ibid.*, cap. 28, "Naturalia clausa incisione curantur."
[17] *Ibid.*, cap. 70.
[18] *Ibid.*, cap. 1.
[19] *Ibid.*, cap. 3.
[20] *Ibid.*, cap. 89.
[21] *Ibid.*, cap. 83.
[22] *Ibid.*, cap. 22.

and in the summer cucumbers, watermelons, and muskmelons.[23]

Benivieni is also deserving of some credit for originality. He cites authorities little; he is not following directly in the footsteps of Galen or Avicenna; nor is he, like the contemporary humanist physician, Leonicenus, tied to the apron-strings of Dioscorides. Probably a number of his cases are taken without acknowledgment from earlier collections of *consilia*. His claim to have cut in so far as to see a bit of the heart, yet the patient recovered, goes back even to Galen,[24] and the lame man made whole by a fall from a height is another antiquated story.[25] But in the main he has the air of giving his own observed facts and of making up his own lies. This is refreshing, if at times a bit crude.

Such then is the naïve, unpretentious, and not always reliable work of Antonio Benivieni. Its importance appears to have been exaggerated by past historians of medicine: partly perhaps because it was more accessible in print, easier to read, and better known than earlier and more elaborate works in manuscript; partly because it was felt that modern medicine ought to begin with modern history about 1500 and not before. Historians have therefore looked to the first printed books on medicine by authors living at that time for the first signs of modern development. A good deal of false historical emphasis has resulted from making much of the first printed specimen of this and that: the first Greek or Hebrew grammar to appear in type, for example, or the first printed herbals. These were important events in the history of printing perhaps, but they are of no great significance in the history of Greek or of Hebrew or of botany. These subjects had a long previous history, to which printing added merely a mechanical improvement and increased publicity. But the earliest printed herbals were not necessarily of any great value *per se* and may have been inferior to preceding works in manuscript. Thus, while much attention has been lavished on early printed German herbals, a fundamental name in the history of botany like Rufinus in the thirteenth century has remained long neglected,[26] and the accident of printing has introduced a false perspective into the history of science. In like manner our finding that Benivieni's book is slight in most respects and even backward in some, warns us not to accept unquestioningly former estimates of medical authors of that time until they shall have been compared in more detail with the medical writings of the centuries preceding and so properly evaluated in relation to their setting. Thus Paul Bagellardus of Fiume wrote the first book printed in the field of pediatrics but has been shown to depend largely on Rasis[27] (865-925 A.D.). Similarly the work on *The Care of the Child* (*De regimine infantis*) by Cornelius Roelants, printed in 1483-1484,[28] was based partly on the early medieval *Passiones puerorum adhuc in cunabulis,* of which many manuscripts are extant, partly on the pseudo-Galen *De passionibus puerorum.*

Besides the *De abditis . . . causis,* Benivieni is said to have composed a pest tract and surgical work which are no longer extant and a *De virtutibus* which Gurlt states is still in manuscript[29] but which I have not seen. I have examined, however, a *Rule of Health* by him in a manuscript at Venice.[30] In its preface he explains to Lorenzo de' Medici that he abandoned the art of

[23] *Ibid.*, cap. 21.
[24] *Ibid.*, cap. 42, and see Kühn, *Claudii Galeni opera omnia,* II, 631.
[25] *De abditis . . . causis,* cap. 55.
[26] See my "Rufinus: a Forgotten Botanist of the Thirteenth Century," *Isis,* XVIII (1932), pp. 63-76.
[27] *Libellus de aegritudinibus infantium earumque remediis partes duae,* Padua, 1472; also in 1487, and by Pierre Tolet in 1538. Another form of the title is *De infantium aegritudinibus et remediis.* Valentinelli, in describing S. Marco XIV, 32 (L.VII.X), a MS copied from the printed edition, states that the author taught philosophy at Padua from 1441, the extraordinary chair of medical practice beginning in 1444, and the ordinary chair of medical theory beginning in 1472. He died in 1494. The Pierpont Morgan library, New York, has a copy of the first edition. On the general subject see K. Sudhoff, *Erstlinge der pädiatrischen Literatur: drei Wiegendrucke über Heilung und Pflege des Kindes. In Faksimile hrsg. u. in die literarische Gesamtentwicklung des Faches hineingestellt,* Munich, 1925.
[28] Copinger 5142.
[29] S. Marco VII.29 (Valentinelli, XIV, 54, incorrectly dated 14th century), 30 small fols.: rubric, "Antonii Benivienii ad Laurentium Medicem de regimine sanitatis liber primus incipit"; opening words of dedicatory preface, "Cum parentum preceptis et amicorum meorum ortatu . . ."; incipit of text proper, "Cum statuissem aliquid in hoc tempore ad te scribere, mi Laurenti . . ."
[30] *Ibid.*, fols. 10v-11r (I, 5).

oratory for philosophy and medicine at the urging of parents and friends, and is not sorry for the change. Lorenzo's father and grandfather had been protectors of his earlier studies. As he sent to them some of his oratorical exercises, so he has composed this booklet on the preservation of health for Lorenzo. It divides into two books of five and nine chapters respectively. It is professedly a compilation and seems a perfunctory treatise, quite lacking in the originality which marks the *De abditis causis*. At the time of writing the *Rule of Health* Benivieni was apparently only embarking upon his medical career and did not yet have the ripe experience of which the *De abditis causis* was the fruit. In a chapter on the regimen for boys he warns that their morals require especial care, and that at the age of six the boy should be sent to a master to begin his training in letters, but that he should not be compelled to remain in school the whole day, "lest his nature decline to sluggishness and languor."[30]

CHAPTER LXVI

THE ATTACK ON PLINY

The position of science in the age of humanism and the stage of advancement to which it had attained at the opening of the last decade of the fifteenth century are well illustrated by the treatise, originally slight, of Nicolaus Leonicenus on the errors of Pliny and other authors in medicine[1] and the elaborate response

[1] The editio princeps (or what has always been so regarded) of Ferrara, 1492 [Hain *10021]—signatures a 4, b 2, c 3—opens with the letter of Politian: "Angelus Politianus Nicolao Leoniceno sal. d. Dictata illa tua Nicolae quibus Avicenne refellis inscitiam . . . / . . . aut aliquanto fortius quam certe adhuc fecisse videris convellenda. Vale. Florentie die iii Ianuarii M. CCCC. lxxxxi." Then follows at fol. a 2 recto: "Nicolai Leoniceni de Plinii et plurium aliorum in medicina erroribus liber ad doctissimum virum Angelum Politianum." The text opens, "Gaudeo plurimum Angele vir doctissime studium meum . . ." and ends, ". . . Plinii ac plurium aliorum auctorum qui de simplicibus medicaminibus scripserunt. Errores notati ab excellentissimo artium et medicine doctore d. magistro Nicolao Leoniceno Vicentino. Impressi Ferrarie per magistrum Laurentium de Valentia et Andream de Castronovo socios die xviii Decembris anno domini 1492."

This date, 1492, raises difficulties, and one wonders if it should not be 1491. In the first place it seems a little odd that Leonicenus should take almost two years to write and publish a tract of only eighteen leaves in reply to Politian's letter. But perhaps Politian's letter is dated according to the *calculus Florentinus*, by which the year 1492 would not begin until March 25. In the second place, the treatise of Leonicenus speaks of Lorenzo de' Medici as living, whereas he died on April 8, 1492. In the third place, Hermolaus Barbarus in his *Castigationes Plinianae*, of which the preface to pope Alexander VI is dated in August, 1492, while the first and main volume is dated in November, 1492, is evidently acquainted with the *De erroribus* of Leonicenus and refutes some of its assertions. Finally, the elaborate response of Collenucius appears to have been already composed when the work of Hermolaus Barbarus was published. Collenucius then added a supplement and sent his *Defensio* to press before the death of Barbarus in July, 1493.

The only other solution would seem to be that the work of Leonicenus circulated in manuscript form before it was printed. To this supposition some support is lent by a letter of Collenucius, written while his own *Defensio* was in press ("Nos interea dum nostrae defensionis maturitas expectatur," Saviotti, 1888, p. 254), which Saviotti published from the state archives of Florence. Collenucius opens it by saying, "Audio Nicolaum Leonicenum eum dico cuius libellus accusationem Plinii continens circumfertur . . ." (*ibid.*, p. 253) and later remarks, "Leoniceni libellus ita, si memini, subscriptus est: 'Plinii errores notati a Domino Magis-

which it evoked from Pandolphus Collenucius of Pesaro.[2] Both works were printed at Ferrara, and that of Collenucius was addressed to its duke, Ercole d'Este. Leonicenus, for reasons that will presently appear, had addressed his to Angelo Poliziano, the

tro Nicolao Leoniceno etc.' " This is not the exact title of the work as printed, and it would also appear from it that the copy of Leonicenus's work on which Collenucius had based his defense was no longer in his possession. This would be more apt to be true of a manuscript copy passed about than of a printed copy. We would have further to suppose, moreover, that a manuscript copy had reached Hermolaus Barbarus, presumably at Rome.

There is a good account of Leonicenus in the work of the Carmelite, Angiolgabriello da Santa Maria, *Biblioteca e storia di quei scrittori cosi della città come del territorio di Vicenza,* 1772-1782, 6 vols. in quarto, II, 192 *et seq.* His mother was the daughter of Antonio Loschi, celebrated humanist secretary of Alexander V. Of his five brothers two were regular canons, one skilled in both laws, the others "not mediocre in humane letters." His nephews, Vincent and Thomas, were distinguished doctors of laws.

A modern work on Leonicenus is Domenico Vitaliani, *Della vita e delle opere di Nicolò Leoniceno Vicentino,* Verona, 1892. He sides with Leonicenus in the Pliny controversy.

[2] *Pliniana defensio Pandulphi Collenucii Pisaurensis iurisconsulti adversus Nicolai Leoniceni accusationem* is the title on the fly leaf, but at fol. a 1 verso, following the "Index operis" and address to Ercole d'Este, we read, "Pandulphus Collenucius Pisaurensis Iurisconsultus Pro Plinio adversus Nicolai Leoniceni accusationem": Hain *5483, Ferrara, no date. Signatures: a iiii, b iiii, c iii, d iii, e iii, f iiii, but they are really all quaternions. The text opens: "Qui iustissimas defensiones iniquissimis calumniis obiiciunt, dux inclyte, . . ." The *Defensio* proper ends in the middle of fol. f ii verso, and the rest of the volume is occupied by the comments of Collenucius on the *Castigationes* of Hermolaus Barbarus.

Of modern accounts of Collenucius may be mentioned Alfredo Saviotti, "Pandolfo Collenuccio umanista Pesarese del secolo XV," *Annali della R. Scuola Normale superiore di Pisa. Filosofia e filologia,* V (1888), 33-328; and William Tartt, *Memoirs connected with the life and writings of Pandolfo Collenuccio da Pesaro,* London, 1860. Saviotti credits Tartt with being the first biographer of Collenuccio who really examined his works. Saviotti's monograph appears to supersede Tartt on most matters of biography, chronology, and the Italian writings of Collenuccio. But his chapter on the controversy with Leoniceno—on the merits of which, and its scientific side especially, he refused to pass any judgment—is inadequate. Although it provides some interesting and valuable sidelights, not all of which can be rehearsed here, it also contains some minor inaccuracies such as calling the chapters of the *Defensio* "books" (*libri*), and stating that Collenucius added an eighth book with reference to the *Castigationes* of Barbarus, whereas it is a supplementary treatise distinct from the *Defensio Pliniana* in seven chapters which precedes it. It seems doubtful whether Saviotti had examined the original editions of the works of Leonicenus and Collenucius, at least with any care. I have not seen his *Una polemica tra due umanisti del secolo XV,* Salerno, 1887, 19 pp., but presume that it is largely embodied in the book published a year later.

leading humanist of Florence. Both writers sang the praises of Pico della Mirandola, and if Pandolphus failed to follow Leonicenus in eulogizing Lorenzo de' Medici,[3] for whom in 1490 he had executed a mission to Bologna and then had become podestà of Florence,[4] it was probably because that ruler's death had occurred in the interval between their two publications.

In a previous letter to Politian which seems no longer extant, Leonicenus, besides passing strictures upon Avicenna and medieval medical writers that were more to Politian's taste, had ventured to charge Pliny with having confused the Greek herb, *cisthon,* with the Latin *hedera.* To this communication Politian replied in a letter of January 3, 1491, defending Pliny and gently rebuking Leonicenus for having attacked so grave an authority on such slight and insufficient grounds. Instead of subsiding, however, Leonicenus went on to enlarge and develop his criticism and to publish it. He asserted that, had he wished, he could have filled an entire volume with Pliny's errors.[5] But his actual publication consisted of only a few sheets without division into chapters or even paragraphs.[6]

Furthermore, the criticism made by Leonicenus was neither what a modern reader or scientist might expect nor was it, at least to our minds, especially sensational or important. Although Leonicenus offered the sensible general stricture that Pliny had tried to cover too much ground and could not possibly have verified all his data and statements, his censure of the *Natural History* was confined chiefly to somewhat petty details. He purposely limited his critique to Pliny's treatment of herbs and fruits em-

[3] Leonicenus praised Pico and Lorenzo in opening his work: in the *Defensio* see fol. (a viii) recto, "viro incomparabili Pico Mirandulae"; fol. b i recto, "ut vir rarissimus dicere Picus solet."

[4] Saviotti (1888), p. 83.

[5] *De Plinii . . . erroribus,* 1492, fol. a 2 verso: "Quod si is mihi animus tunc fuisset aut nunc etiam esset Plinii errata in lucem patefacere potuissem et tunc et nunc quoque possem integrum de eisdem implere volumen."

[6] This continued to be the case in the edition of 1509, although an "Index huius operis" constituted a table of contents, but in the edition of 1532 the original text was divided into thirty-nine chapters. This was not yet the case in the edition of 1529, Basel, Henricus Petrus (copy at the Academy of Medicine, New York) in which the *De erroribus* in four books is followed at p. 245 by *De dipsade* and at pp. 309-318 by *De tiro seu vipera.*

ployed medically, although he digressed from this long enough to call attention to such astronomical errors as that the moon is larger than the earth. To which Collenucius of course responded that Pliny could not possibly have meant to assert anything of the sort. The attack upon the botanical and pharmaceutical portions of the *Natural History* was based on verbal and philological rather than scientific or medical grounds and did not amount in sum to much more than this, that Pliny had got the names of certain herbs wrong. Leonicenus charged that Pliny had been deceived by verbal resemblances, had made several herbs of one plant found under different names, and had confused the Greek and Latin appellations. In this textual, rather than scientific or rational, criticism of the *Natural History* Leonicenus took Dioscorides as his standard and in general maintained the superiority of Greek to Latin or Arabic authors. He implied that Pliny had taken a great deal from Dioscorides as well as from Theophrastus, while Collenucius argued that Dioscorides was known to Pliny only by name. But their discussion of the relative merits of Pliny and Dioscorides and of the correctness or erroneousness of Pliny's nomenclature and whether he associated the right medicinal virtues with certain herbs and drugs need scarcely concern us further.

More germane to our investigation is the fact that seldom does either Leonicenus or Collenucius display rational scepticism or make scientific objection to the frequently occult and marvelous character of those virtues, which was indeed a feature common to the botany of Pliny, Theophrastus, and Dioscorides, and to the pharmacy of Galen, Avicenna, Serapion, or Simon Cordo. Leonicenus may scorn Avicenna and Gentile da Foligno but he still believes that a root of *cyclamen* is so hostile to those in pregnancy that, if a woman with child steps over it, it produces abortion.[7] He still states that the viper in conceiving bites off the head of the male, and that the young gnaw their way out of the womb, and he attacks Gentile for having held that the snakes or vipers

[7] *De Plinii . . . erroribus,* 1492, fol. (a 5) recto.

employed in making theriac need not be of this type.[8] A few years later, in a brief separate tract or letter on the viper, Leonicenus, maintaining its identity with the reptile called *marassus* in the Italy of his time, quoted Aristotle as stating that all other snakes hatched their young from eggs, while the viper bore its alive. Therefore the *marassi* must be vipers, since they could often be seen hanging from high branches with disrupted wombs.[9] Indeed, the anxiety of Leonicenus as to the uncertainty of the names of herbs and drugs in Pliny and recent authors is largely lest their great powers be misapplied and ill result.

The single instance in which Leonicenus showed himself less credulous than Collenucius concerned the belief that cinnabar was a mixture of the blood of the dragon and the elephant in their mortal combat. Leonicenus held that Pliny followed popular opinion in repeating this fable which Dioscorides had declared false, and that cinnabar was a mineral substance.[10] Collenucius called this a piece of arrogance on the part of Leonicenus. Solinus supported Pliny's statement, and practically all historians and writers on nature repeated the story of the dragon's crushing the elephant in its folds only to be crushed to death itself by the falling elephant's weight. There existed also, it is true, the metallic cinnabar of which Dioscorides wrote and of which there was both the natural variety and a poisonous, artificial kind made from quicksilver and sulphur. But Dioscorides had surely only meant that it was false to call this Libyan metallic variety a mixture of

[8] *Ibid.,* fols. b verso-b 2 recto.

[9] *Nicolai Leoniceni . . . opuscula,* ed. of Basel, 1532, fol. 110v. Yet Baldus Angelus Abbatius, *De admirabili viperae natura et de mirificis eiusdem facultatibus,* Urbino, 1589, p. 6, could represent Leonicenus as the first to reject the tale of the young vipers breaking their way out of the mother's womb, and Collenucius as one of those who believed it, whereas as a matter of fact, as we shall presently see, Collenucius denied it of the *marassus,* while Leonicenus accepted it for both the viper and *marassus* which he identified. A correct discussion of the matter seems rather to date from the treatise of Franciscus Caballus of Brescia, *De animali pastillos theriacos et theriacam ingrediente liber,* which was printed in 1499 at Venice with works of Bartholomaeus Montagnana, if not earlier with the *Consilia* of Cermisonus. For these two editions see Pollard, *Fifteenth Century Books in the British Museum,* V, 453 and 574. Neither Caballus nor Leonicenus alludes to the other's work.

[10] *De Plinii . . . erroribus,* 1492, fol. c 3 r-v.

the blood of dragon and elephant. His statement did not apply to the cinnabar imported from India which was that animal mixture and exceedingly rare in Italy. The painter, Hercules of Ferrara, had given Collenucius a bit of it and had promised to verify its genuineness some time. And why, asked Collenucius, should not the blood of elephant and dragon be employed efficaciously in medicine, when purple was made from the fluid of shellfish, when musk came from the pard, when the lotion of the lynx fallen on the sand was highly valued, and when *mumia* from a dead man's skull was so prized in medicine? By such twists and turnings did Collenucius strive to save the old legend, and it may be questioned whether any doubt concerning it would have arisen in the mind of Leonicenus, if Dioscorides had only asserted it.[11]

Another noteworthy point is that the defender of Pliny, Collenucius, although a jurist by profession, displays both a wider knowledge of the *Natural History* itself and more real acquaintance with plants and nature than does Pliny's critic, Leonicenus, who was a physician. In designating herbs, says Pandolphus, not the authority of the writer nor the censure of Leonicenus are to be considered but the plant itself, its virtue and figure, plainly exhibiting whatever the medicament is which is under discussion.[12] One treating of herbs should study the soil and fields rather than books and letters. It is not enough to read herbals, look at pictures of plants, study Greek dictionaries, and hang on the words of one master. One ought to question rustics and mountaineers, inspect the herbs personally, note their differences, and, if possible, test what each can do in diseases.[13] To this standard Collenucius conforms better than Leonicenus, although he is unfair in implying that the latter scarcely observed nature at all. Indeed, in another passage he suggests that if Nicolaus had shown the same diligence in investigating herbs as he has in trying to find mistakes in Pliny, he would have contributed more to the advancement of science.[14] He further complains that

[11] *Pliniana defensio,* fols. e i verso-e iii recto.
[12] *Ibid.,* fol. (a vii) recto.
[13] *Ibid.,* fol. (d vi) recto.
[14] *Ibid.,* fol. b ii verso.

Leonicenus has adduced no reason or experience to convict Pliny of error.[15]

Collenucius seems to have possessed something in the nature of a cabinet or collection of natural history, since he speaks of owning a specimen of the stone, *Leucographis,* which he had shown to Pico della Mirandola and Antonius Faventinus, and also one of the stone, *Morocthus,* which he had exhibited to many persons and which gave off a white milk when rubbed and made white lines on cloth.[16] Concerning herbs Collenucius appears to have learned a good deal at Venice, that great center then for the diffusion of information as well as commodities. There he had talked with herbalists; there he had seen the plant called *tripolium* both in pictures and in life; there the *empetrum* of antiquity was well known under the slightly altered name, *sampetra,* being imported in large quantities from Istria and Leghorn.[17] There in the street of the spice-dealers in a shop having as its sign the head of an Ethiopian he had consulted an herbal in which the plants were represented so carefully and artfully that you would have thought they grew on its pages.[18] He also alludes to herbs found in monastic gardens.

It is to be remembered that Collenucius was a man whose life was occupied with many public offices and embassies, and that, if the attack by Leonicenus was not printed until December 18, 1492,[19] he must have written his reply in a great hurry, since it was already completed and in press when the recently published *Castigationes Plinianae* of Hermolaus Barbarus arrived from

[15] *Pliniana defensio,* fol. b iii verso.
[16] *Ibid.,* fols. (a viii) verso and b i recto. Saviotti (1888), p. 49, misinterprets these passages as referring to herbs and supporting the statement of Bonamini in 1776 that Collenuccio had composed an herbal at Venice. This is probably a perversion of the passage (*Defensio Pliniana,* fol. c i verso) in which Collenucius tells of an Herbal which he had seen in a spice-dealer's shop at Venice. Saviotti gives little or no assistance in determining when and where Collenucius obtained his scientific information or education.
[17] *Ibid.,* fol. b ii recto, b iii recto.
[18] *Ibid.,* fol. c i verso. Valentinelli, *Bibliotheca manuscripta ad S. Marci Venetiarum,* V (1872), 65-66, has shown that this was the *De simplicibus* of Benedetto Rinio, with pictures of the plants by the Venetian painter, Andrea Amadio. The MS is now S. Marco VI, 59 (Valentinelli, XIII, 10).
[19] See note 1 above as to the difficulties raised by this date.

Rome and led him to add a supplementary treatise.[20] Yet this hasty work is not only longer and more orderly in arrangement but also seems more thorough than that on which Leonicenus had been able to take his own time. There can be little doubt that Collenucius was a far abler mind and diversified genius than Leonicenus. Pliny was fortunate in his defender. On the other hand, it must be admitted that the *Defensio* indulges too much in invective, although in opening it Collenucius called Leonicenus his learned friend and professed his intention of abstaining from violent language.

Collenucius also seems much better acquainted than Leonicenus with the recent literature on the subject. When the latter asserted that Pliny's treatment of an herb was paralleled by no other author, Collenucius pointed out that James of Corneto had written a treatise especially on this *tripolium* and that Gentile da Foligno had praised its medicinal effects in his *Consilia* in discussing cures for dropsy.[21] Leonicenus had asserted that no author ascribed to the herb, *aristolochia,* the property of killing fish. But duke Ercole's own brother, Sigismund of Este, had told Collenucius that this same property was ascribed to the root in Campania under the new name, *malum terragnum* or *malum terrae.*[22] In general, while Leonicenus was inclined to shun present day popular names and notions concerning herbs, to rely primarily on ancient Greek authors, and to criticize Pliny, Avicenna, Serapion, and medieval Latin writers, Collenucius questioned the superiority of the Greeks and found information of value in recent writings and vulgar botany. He writes,

[20] Following the "Finis defensionis" at fol. f ii recto we read, "Pandulphus Collenutius Pisaurensis Iurisconsultus Studiosis Salutem. Quot qualesve loci sint in Plinianis castigationibus viri eruditissimi Hermolai Barbari qui ad Plinianam defensionem nostram pertineant. Absoluta iam atque edita defensione nostra . . ." and at fol. f ii verso, ". . . Ecce ex urbe Roma Plinianae castigationes nuper editae." The *Castigationes* were dated 24 November 1492, with a supplementary volume in smaller type on February 13, 1493; but Dr. Arnold C. Klebs who has given much study to scientific incunabula suggests that the first volume may not have been put into circulation until the second was ready. In the copy which I used at Munich they were bound together.

[21] *Defensio Pliniana,* fol. b ii recto.

[22] *Ibid.,* fol. (b vi) recto.

But we who neither lay claim to knowledge of the art of medicine nor, addicted to the vanities of the Greeks, have rejected so many statements, but admire and cherish likewise the genius of our modern writers, we think it wrong and unworthy of a studious man, if we do not read over once every book that comes to hand.[23]

Nor did he limit his omnivorous reading to printed books. He had examined the manuscript text and pointed out that the codex of Pliny corrected by Guarino of Verona and preserved in a monastic library at Ferrara offered a different reading from that which Leonicenus had drawn from the printed versions.[24] In fine, the supporter of Pliny and of medieval medical authors surpasses their opponent not only in breadth and depth of botanical knowledge but sometimes even in textual criticism.

Meanwhile, as we have seen, there had appeared the *Castigationes Plinianae* or emendations of the text of the *Natural History* of Hermolaus Barbarus, patrician of Venice and patriarch of Aquileia.[25] He claimed to have freed the text from some five thousand errors of copyists and printers, but did not wish anyone to think that Pliny himself had erred and affirmed that his reputation could in no way be overthrown.[26] Without mentioning Leonicenus by name, Barbarus expressly refuted—and that rather sharply—some of his criticisms of Pliny. For example, in substituting the reading *iasione* for *lasine* in the twenty-second book, twenty-second chapter, of the *Natural History,* Barbarus remarked that certain persons, not knowing that the word, *lasine,* is corrupt, blame Pliny as if he had uselessly repeated this herb in

[23] *Ibid.,* fol. b ii recto. Lilio Giraldi asserted that he had found in Collenuccio's handwriting a collection of additional Pythagorean precepts for which no other source is known: see Ch. Josserand, "Les symboles pythagoriciens de Collenuccio," *L'antiquité classique,* I (1932), p. 146.

[24] *Ibid.,* fol. (c v) recto.

[25] *Castigationes Plinianae Hermolai Barbari Aquileiensis pontificis:* Hain *2421. The preface to Alexander VI is dated in August, 1492; the printing of the text by Eucharius Argenteus (Silber) Germanus in November, 1492; and additional *Castigationes* and an emendation of Pomponius Mela, both by the same printer but in smaller type, in February, 1493. The work of Arnaldo Ferriguto, "Almorò Barbaro," *Miscellanea di storia veneta,* XV (1922), 512 pp., has little to our purpose.

[26] *Ibid.,* fols. (a) verso-a 2 recto.

the twenty-fourth book, calling *lagine,* forsooth, *lasine.* "But since this herb is far different from that, as is clear from the previous book, nor is there that verbal affinity which they thought, they will have scant regard for their modesty unless they recant their view." With reference to cinnabar, Barbarus observed that there are those who say that its identification with dragon's blood is a fable and who laugh at Pliny for repeating what the ancients had said. Barbarus denies that Dioscorides called it fabulous when he merely said that some have thought that it was the blood of the dragon. A drug called dragon's blood is sold today at a great price since it is genuine and unadulterated, and many think it is true cinnabar.[27]

As has been said, Collenucius affirms that the *Castigationes* came to his attention only after he had completed and sent to press his defense of Pliny, as Pico della Mirandola, Politian, and others could testify.[28] He then added a supplement to make clear that Barbarus did not support the attitude of Leonicenus. Out of twenty-eight cases, he asserts, the new readings suggested by Barbarus supported Leonicenus in only three. Collenucius felt, however, that Barbarus had carried revision of the text of Pliny too far when he had altered readings found in the oldest manuscripts by guess-work and *tours de force* (*divinatio et vis*) or in order to make Pliny agree with Greek authors. On the other hand, Collenucius did not accept Barbarus's opinion that Dioscorides was contemporary with Pliny or even later, although it would have fortified his defense of Pliny against Leonicenus.[29]

Even Leonicenus admitted that Pliny had found a defender in Barbarus and a very capable one. After the appearance of the *Castigationes,* Leonicenus set about a composition in the form of a letter to Barbarus, claiming that the *Castigationes* supported him on various points and seeking to convince Hermolaus of the

[27] *Castigationes:* in re *Historia naturalis,* XXXIII, 7.

[28] *Defensio Pliniana,* fol. f iiii verso: ". . . tam vir incomparabilis Picus Mirandula quam Politianus noster ad quem illam misimus viderunt, tum Ludovicus Carrus atque Antonius Faventinus illustres medici et vir doctissimus Lucas Ripa Regiensis illam audiverunt et legerunt."

[29] *Ibid.,* fol. (f v) recto.

justice of his further criticisms of Pliny which the *Castigationes* had not sanctioned. Barbarus died before this letter was finished so that, instead of sending it to him, Leonicenus terminated it with a lament at his death. This letter to Barbarus was printed in 1509, if not before. Leonicenus was even inclined to apologize a little for his attack on Pliny to the author of the *Castigationes,* whose attitude towards Pliny he compared to that of an indulgent father correcting an adopted son with paternal love, overlooking his errors and blaming everything on printers and copyists, while he (Leonicenus) as more of a stranger had perhaps acted more severely than was fitting towards a man who in his judgment, too, was most outstanding and had merited the best treatment from humanity but who as a man was likewise liable to error. Leonicenus, however, stubbornly maintained all his previous particular criticisms and affirmed that there were a thousand more errors which he might mention. He further asserted that his main motive in indicating Pliny's mistakes had been to save human life by preventing the administration of wrong medicines, and that therefore his criticism should not be stigmatized as rash and impudent.

That this explanation was somewhat disingenuous is indicated by a later letter of Leonicenus to Franciscus Tottus of Lucca[30] who had complained because he took no notice of queries which a physician whom they both knew had raised on the basis of a newly discovered codex of the *Natural History.* Leonicenus excuses his delay on the ground that he is reluctant to return to the old game. He now confesses that it seems only a sort of sport to him to dispute concerning Pliny's errors. For there are many other errors in works of medicine highly esteemed by the present age which are much more perilous to human life. Very few persons read Pliny for his medical content, while more read him for his words and style, and many would rank him not among physicians or philosophers but in the number of historians and orators. Here, in addition to proof of the insincerity or superficiality of some of Leonicenus's previous professions, was sug-

[30] Edition of 1509, fols. 35v-82v; edition of 1532, fol. 22 verso.

gestion of a new line of attack upon Pliny's reputation and authority which had not been present in the original *De erroribus*.

Indeed, already in the letter to Hermolaus Barbarus Leonicenus had departed somewhat from the style and method of his original attack. For one thing, it is evident that he is attempting to defend himself against some of the charges of Collenucius whom he does not deign to mention by name but to whom he refers as *quidam legulei*.[31] He denies the statement of Barbarus that he (Leonicenus) had ridiculed Pliny, but he thinks it no crime sometimes not to believe him and refuses to accept his authority without reason, "as certain little lawyers demand of us who rely solely on authors." Thus Leonicenus throws back at Collenucius the charge which the latter had made against himself. Again, if he is unacquainted with the grammarian Placidius, as Barbarus had implied, he feels that this is a small fault in one who pays attention to nothing less than to mere study of words.[32] Or he tries to match Collenucius's acquaintance with herbs in popular use by asserting that *centaurium maius*, which Peter of Abano said was no longer known, and *eupatorium*, with which physicians of the present are unacquainted, are herbs found in Italy but whose vulgar names he abstains from divulging for the time being lest he seem to anticipate Barbarus's announced treatise in such matters, and give color to those writers against him who have sought to promote discord between Barbarus and himself.[33] This excuse ceased to have any force after the death of Barbarus which occurred before Leonicenus had finished his letter to him and therefore must be regarded as another bit of disingenuousness on the part of Leonicenus.

Despite his professed reluctance to return to what he now affected to belittle as a mere game, Leonicenus in the letter to Tottus, which forms the third and longest item in the edition of 1509, added further errors of Pliny, including animals and minerals as well as plants. He also called in question the authority of Aristotle who, "although he was a great miracle of nature, yet was not entirely free from error."[34] And he further dwelt upon the errors of Avicenna and other Arabic authors, or those of medieval Latin medical writers like Gentile and Mundinus. This was also a feature of his treatise, *De morbo gallico*, first printed in 1497. In its preface he reminded Giovanni Francesco Mirandola, Pico's nephew, that he had recently at Ferrara expressed surprise that Leonicenus had let Pliny off so lightly in the *De erroribus*, since he himself had noted many additional errors.

In 1498 Leonicenus published at Venice a brief letter on the viper in which he reaffirmed the view expressed in the *De erroribus* that the *marassi* of fifteenth century Italy were identical with the vipers employed by the ancients in compounding theriac.[35] The work is of further interest for another unmistakable allusion to Collenucius. After correcting Bartholomew of Montagna for stating that Galen used the word, *marassus*, for a snake, whereas he merely mentioned the Marsi as snake-hunters or charmers, Leonicenus affects suddenly to recall with amusement the trick of a certain *littérateur* ("cuiusdam literatoris ingenium") who had accused him of the same mistake calumniously, "as if I had not learned those tribal names as a school-boy."[36] Collenucius likewise composed a special tract on the viper in reply, but then seems to have thought better of publishing it. It was not printed until after his death, when his son Annibale discovered it among his papers.[37] Collenucius insisted that the Italian *marassus* could not be identified with the viper employed by the ancients in theriac, since their statements concerning the viper did not hold true of it, notably those concerning its mode of conception and

[31] Edition of 1509, fol. 34v; edition of 1532, fol. 22r; and again, in the third book, edition of 1509, fol. 43v; edition of 1532, fol. 27v, as "quodam leguleo Plinii patrono"; and, ed. of 1509, fol. 64v; ed. of 1532, fol. 41r, "quidam leguleus." His henchman, Ludovicus Ponticus Virunius, however, made a direct attack on Collenucius: *Invectiva contra Pandulphum Collenutium pro Nicolao Leoniceno de Plinii et plurium medicorum in medicina erroribus*, 1509, Ferrariae per Ioannem Maciochum.

[32] Edition of 1509, fol. 32v; edition of 1532, fol. 20v.

[33] Ed. of 1509, fol. 25v; ed. of 1532, fols. 15v-16r.

[34] Ed. of 1509, fol. 58r; ed. of 1532, fol. 37r.

[35] *Di tiro seu vipera ad prestantem medicum Alexandrum Agathimerum Venetum epistula*, Venice, 1498. And in the *Opuscula* of 1532.

[36] Ed. of 1532, fol. 109v.

[37] *De vipera libellus*, Venice, 1506; see Saviotti (1888), p. 109.

delivery, both of which the *marassi* performed in an ordinary manner, as "six hundred farmers and shepherds" in the region around Ferrara alone could testify. Collenucius also stated that while this work of his on the viper was in preparation Leonicenus got wind of some of its contentions and tried to meet them in another treatise *De dipsade* to which Collenucius now further replied. These three tracts, although rather venomous in more senses than one, were something of an anti-climax to, and petering-out of, the Pliny controversy. However, early in 1504, Leonicenus once more addressed a letter on the theme of the errors of Pliny and others to yet another physician, Hieronymus Menochius. A few months later occurred the death of Collenucius.

In 1509 Ludovicus Bonaciolus, a physician of Ferrara, printed this last mentioned work of Leonicenus,[38] together with the original *De erroribus* and the two intervening letters, at his expense but not, as he assures us in a preface, for profit but to save human life. Bonaciolus also minimized the criticism of Pliny and stressed the attack of Leonicenus upon Avicenna and other barbarians. Further editions of the expanded *De erroribus* appeared at Basel in 1529 and 1532,[39] while the *Defensio Pliniana* of Collenucius seems not to have been reprinted until 1536.[40] Indeed, by outliving Barbarus and Collenucius and by continuing to discuss the errors of Pliny and others Leonicenus to a certain extent held the field.

While criticizing medieval Latin writers on medicinal simples Leonicenus had quite failed to recognize that some of them had not only shown a like general interest in names but had touched on the same particular points as himself. Thus Sante Ardoini in the first half of the century in his work on poisons often gives Arabic words or Greek etymologies or the different local names in various parts of Italy. Moreover, of seven errors in making theriac which he lists the first is not employing vipers;[41] he brings

[38] "Impressum Ferrariae per Ioannem Maciochum MDIX quarto Cale. Maii." There is no single title, the titles of the four component treatises being grouped together on the title page. Two pages of errata follow the close.

[39] For the edition of 1529 see above, note 6. In that of 1532 our four treatises occupy the first 61 leaves and are followed by other opuscula.

[40] In *Herbarum vivae icones* of Otto Brunfels (1488-1534), II (1536), 205-232.

[41] *Santis Ardoyni Pisaurensis medici et philosophi praestantissimi opus de venenis,* Basel, 1562, I, 10, p. 91.

together the terms *prasium, porrum,* and *prason* in somewhat the same way as Leonicenus;[42] and he asserts that the translators or commentators of Rasis and Averroes put *cicuta* for *harmel,* thereby deceiving Constantinus Africanus and Platearius, but that the citations of Dioscorides and Galen by Rasis and Averroes show that they meant *harmel,* not *cicuta.*[43]

Leonicenus continued to lay himself open to criticism and to become involved in controversies. His work on syphilis, printed in 1497, immediately aroused an opponent, so that Antonius Scanarolus of Modena, a pupil of Leonicenus, felt obliged to rally to his defense in a tract printed in 1498.[44] A subsequent publication of his takes us well into the next century but illuminates by a reflected light that in which we are now interested. His new translation of the *Aphorisms* of Hippocrates with Galen's commentary thereon, published in 1509, aroused so much criticism in the universities of Bologna, Padua, and Ferrara that he felt it advisable to issue a defense against its detractors.[45] He blamed the printers for many errors and adduced as a further excuse the fact that

[42] *Ibid.,* IV, 3, p. 225: "Stellio est serpens quadrupes . . . et ab aliquibus dicitur prasium quia habet colorem similem in viriditate colori porri quod Graece dicitur prason"; VI, 24, p. 364, "Ab aliquibus autem auctoribus vocatur prasium quod sic dicitur ἀπὸ τῶ πράσω Graece quod est Latine porrum, est enim viridis ut folium porri. . . ." Compare Leonicenus, *De erroribus,* 1509, fol. 5r: "Multas herbas ac fructices foliis marubio similibus scribunt Dioscorides Galen ac Paulus quas omnes Plinius non prassio i. marubio sed prasso i. porro folia tradit habere similia."

[43] *Santis Ardoyni . . . de venenis,* II, 62, p. 206. Compare Leonicenus, *De erroribus,* 1509, "Error medicorum per Armel quae miscetur pilulis ex hermodactylis cicutam intelligentium": text at fol. 19r, "Non sit tanti unus accentus ut quo cum Armel scribitur apud arabes cum aspiratione significat cicutam, cum sine aspiratione rutam silvestrem, aliquando ex tantilla nota hominum vita periclitetur?"

[44] *Disputatio utilis de morbo gallico et opinionis Nicolai Leoniceni confirmatio contra adversarium eandem opinionem oppugnantem,* Bologna, 26 March 1498. For a similar controversy in Germany, 1498-1501, between Martin Polich of Mellerstadt and Simon Pistoris see C. H. Fuchs, *Die ältesten Schriftsteller über die Lustseuche in Deutschland,* 1843, pp. 127-288.

[45] *Nicolai Leoniceni medici clarissimi contra obtrectatores apologia* is the title on fol. a recto, while at fol. (a iii) recto we read, *Nicolai Leoniceni contra suarum translationum detractores apologia.* Colophon: "Impressum Venetiis per Iacobum Pentium de Leuco impensis D. Thome Iuncte Florentini anno a nativitate D. nostri M.D.XXII die secundo mensis Ianuarii." I have not seen the original edition of 1509: Ferrara, Macciocchio.

he had used only one faulty manuscript of the text in question, although it might seem that he should rather be blamed for such a procedure. Now Lazarus Bassianus had brought to his attention a much older codex which he thought might be the archetype and he was able to amend some of his readings. He recognized that his critics included leading men of the time such as Jacobus Carpus, a man very learned in medicine and anatomy and "beyond all controversy holding the first place among the surgeons of our time." He defended his own translation chiefly by attacking the previous ones as much worse. Yet Carpus had condemned his translation and preferred the "barbarous" medieval versions.[46] At the head of the *Apologia* are some lines by Thomas Leonicenus who was professor of philosophy at Padua in 1497 and died in 1531, in which he compares Nicolaus to the spider whose offspring lacerate the womb that bore them. So the very men whom Nicolaus has supplied with Hippocrates and Galen turn and rend him. The verses are of interest as another indication that the classical revival involved no improvement in natural history.

Collenucius in 1493 spoke of Leonicenus as already a sexagenarian, and he lived to be nearly a hundred, having been born at Vicenza in 1428 and dying at Ferrara in 1524. These dates incline us to a charitable view of his attack on Pliny and apology for his translations. We are forced to admire the old man not only for pursuing his work of translation into his eighties but for so jauntily assailing Pliny at an age when most men would have grown conservative and in a manner suggestive of the youthful indiscretions of Lorenzo Valla, Ramus, or Sanchez.

The real science of the time, however, had rallied to the support of Pliny. As Collenucius remarked: let the grammarians look after the interpretation of words; we trust in Pliny, that most prudent writer on nature, in the things themselves, and in eyewitnesses.[47] Nor were the humanists in general yet ready to challenge his supremacy, as the letter of Politian and the attitude of

[46] *Ibid.*, fols. (a iii) verso and (b iii) verso.
[47] *Defensio*, fol. (d viii) recto.

Hermolaus Barbarus make clear. Politian, indeed, was recognized by both sides in the controversy as one versed in philosophy as well as letters. That he shared Collenucius's interest in herbs appears from a letter to which Saviotti called attention.[48] In it Politian thanks Collenucius for sending him specimens of *gnaphilium* and Gallic nard which he had found recently in Germany. Both these herbs figured in the controversy with Leonicenus, and Collenucius evidently sent them while on an embassy to Maximilian following the outbreak of the controversy.[49] The attack on Pliny came from a single humanist who seemed bent on making a name for himself and displaying his linguistic ability and knowledge of ancient Greek authors. It was largely bookish and antiquarian, taking little account of present day knowledge of herbs and scorning medieval contributions to botany. Nevertheless it was an attack upon a great past authority. Slight as it may seem, it was both somewhat longer and more substantial than Lorenzo Valla's earlier criticism of Bartolus. It was to be succeeded by other attacks directed not merely against the reputed barbarism of medieval authors but against other great ancients, like the onslaughts of Ramus upon Aristotle. Finally was to come Descartes' rejection of authority and past thought in general and the beginning so-called of modern philosophy. The attack of Leonicenus may have been poorly directed and disingenuous; Collenucius may have been able to overwhelm it rather crushingly. None the less it attracted attention and, right or wrong, it represented an increasing tendency which ultimately was to come to be regarded as modern progress. Agrippa in 1527 cited Leonicenus as having exposed "in an ample volume" the many errors of pharmacists as to the names of drugs.[50]

But the very attention which Leonicenus attracted was largely due to the greatness of the authority whom he ventured to charge with numerous errors. According to his own testimony, his criticism of Pliny aroused a great storm of protest, indignation, and

[48] Saviotti (1888), pp. 95-96.
[49] Politian alludes to the speech which Collenucius had made before Maximilian: *Angeli Politiani Epistolarum libri duodecim*, Strasburg, 1513, VII, 32.
[50] H. C. Agrippa, *De incertitudine et vanitate scientiarum*, cap. 84.

malediction,[51] and he usually alludes in the plural to those who had sprung to the defense of Pliny against his work,[52] although his depreciation of these opponents as unacquainted with either Greek or medicine and totally incompetent to reply to his strictures against Pliny is very probably intended for Collenucius in particular. But he also specifies among his opponents a teacher of boys at Ferrara and a student of Greek grammar.[53] For Collenucius Pliny was a writer never attacked before and never sufficiently praised, and who, while modest as to his own attainments and always careful to acknowledge his sources, had scrupulously distinguished between what he had himself heard or seen and what he stated on the authority of others or with reservation. And if the real science of the time rallied to Pliny's support, this was done not merely from habit, but because it was still so largely identical in content and character with his *Natural History* which, with its confusing jumble of fact and error, science and magic, was well nigh as representative of botany in the fifteenth century as it had been in the first. For it is neither mere coincidence nor a *tour de force* on my part that the author, with whom opened the survey of magic and experimental science during the first thirteen centuries of the Christian era, should also form the theme of this closing chapter upon the fifteenth century, when he was still a dominating figure in the vast field of science, superstition, and error.

[51] Edition of 1509, fol. 35r; ed. of 1532, fol. 22r-v, in the closing paragraph of the letter to Hermolaus Barbarus.

[52] Edition of 1532, fols. 13v, 14r.

[53] *Ibid.*, fols. 27v-28r.

CHAPTER LXVII

CONCLUSION

A few words of summary, review, and reflection upon our findings may be in order before we terminate our account of the fourteenth and fifteenth centuries. The three chief strains in the Ariadne's cord which has conducted us through the labyrinth of the learned literature of that period have been astrology, alchemy, and the retention of magical procedure in medicine. But there have been other intertwining threads: the belief in demons and their association with the occult arts, or the treatment of such arts independently of spirits; the doctrines of occult virtues in nature, and of the power of mind over matter; faith in the possibility and validity of natural magic, fascination, physiognomy, chiromancy, and yet more questionable procedures. Towards the illicit and extreme kinds of magic we have seen repeated the varying attitudes of religious reprehension, rational criticism whether that of hostile scorn or the attempt to find some explanation for the supposed phenomena, and curiosity thinly disguised under a pretense of disapproval, occasionally an open and sympathetic exposition. Science has been called the handmaid of theology in the middle ages but the simile would fit astronomy and astrology much more closely. Indeed astrology largely dominated yet other spheres of scientific interest and activity. While astrological prediction rode high in public favor, producing most of the "best sellers" of the incunabula period and absorbing no small fraction of the time of medical faculties at universities, the transmutation of metals was pursued somewhat more furtively and less generally.

Our investigation of a period which includes codex and incunabula and forms the borderland between the ages of writing and printing has illuminated in varied detail the relation between the printed and manuscript materials. Not only has it been

shown to what an extent the literature of our subject is still unprinted, but also that, where editions exist, the manuscripts are apt to offer a very different and much superior text. Thus the pressing need for modern critical editions and for a comprehensive corpus of medieval scientific writings in Latin, particularly for the two closing medieval centuries, which has already been brought out in my *Science and Thought in the Fifteenth Century,* receives further illustration and proof. May the prospect disclosed of possible rich harvest stimulate new workers to enter the field!

In the conclusion to *A History of Magic and Experimental Science During the First Thirteen Centuries of Our Era* it was stated that the medieval revival of learning seemed to have spent its force by the close of the first quarter of the fourteenth century. The increased space which has been given in the present volumes to the fourteenth and fifteenth centuries over that given to the twelfth and thirteenth in the previous volumes shows that ten years of further study have led to alteration of that estimate, and to corroboration of the suspicion expressed in the aforesaid conclusion that in works of the fourteenth and fifteenth centuries might be found the germs of later scientific discoveries. We have seen the conception of gas already current among the alchemists, to say nothing of scholastic discussion of density and rarefaction. Various theories of attraction and gravitation have been put forward to explain the influence of the moon on tides or the suspension of our globe in mid-space. John de Fundis and others apprehend the process of erosion and the gradualness of geological change. We have heard a theory of the circulation of the spirits somewhat resembling the circulation of the blood. Henry of Hesse has suggested the possibility of the origin of new species. The measurement of minute fractions of time has begun, at least on paper. Records of comets, earthquakes, and the weather are being kept.

On the other hand, the forecast of ten years ago that the writers on occult subjects of the fourteenth and fifteenth centuries would "have little or nothing new to say" has proved unduly pessimistic. At least they have had a great deal more to say, although much of it has not been very novel. In general it is to be remembered that the increased voluminousness of our present treatment is in part due to the greater amount of material extant as one approaches our own time and in part to the fact that we have dealt with many writings which have hitherto been almost unknown and hence needed to be discussed with some fulness.

Yet many names in medicine and mathematics and of commentators on Aristotle of the fourteenth and fifteenth centuries have scarcely been mentioned. Our aim has not been an exhaustive cataloguing but the selection of representative men and writings to illustrate our theme sufficiently and with substantial justice to the rich remains of the period. While it has also not been our purpose to capture and label separately each and every new or apparently new scientific discovery or hypothesis or forward step, we have perhaps in sniffing about among the manuscripts and incunabula and university records come upon the scent of some of the leading and distinguishing interests of the time: the stress on proportion and means and extremes, the intension and remission of forms, the rotation of the elements, the configuration of qualities, the putting of subtle questions and elaborate discussion of *dubia,* the clinical study and recording of medical and surgical cases, the criticism of past authorities and effort to evolve new theories and improved terminology, the development of scientific tables and instruments, the application to natural problems of dialectical skill and precision, while mathematical method and mechanical ingenuity begin to proffer their services to natural philosophy.

We have ranged over many departments of thought and learning and have invaded many fields of human activity and belief. Theology and metaphysics, humanism and scholasticism, astronomy and physics, geography and cosmology, chemistry and meteorology, medicine and surgery, pharmacy and toxicology, botany and zoology, physiognomy and necromancy, Joachimite prophecies and emotionless mathematics are but a few of the

mental states that have been visited. We have gone from the extreme of popular superstition to a rational scepticism and a sound weighing of the credibility of evidence with allowance for human error and weakness which Bayle and Hume might well have envied their fourteenth century predecessor, Nicolas Oresme. Even the economic factor has not been wholly absent. Annual astrological predictions have shown a frequent interest in crops and prices, or we have heard of the government of Venice issuing leather money and that of Florence running salt springs for profit instead of for the public health. Mad dogs have seemed to harass the surface of the earth and comets the face of the sky; image sorcery and pestilence and antichrist have obsessed human fears. But John of Murs has set up his fifteen foot *kardaja,* and John de Dondis has described in detail his elaborate planetary clock. Henry of Hesse, although primarily a theologian and dialectician, has experimented with surface tensions, and, if the questions on perspective ascribed to him are his, has improved in some respects on the views of Dietrich of Friberg. By personal investigation Guy of Vigevano has disproved to his satisfaction an oft repeated citation of Avicenna concerning the aconite plant, and has deliberately risked his life to test a new antidote for that poison. John of Rupescissa has glowed in prison alike with prophetic fervor and with the enthusiasm of the chemical laboratory, and Simon de Phares has smitten his detractor. Careful measurement of the phenomena and bold defiance of obstacles, we have seen not a little of both.

But the age remains superstitious, and its scientific activity and promise seem to fall short of continued achievement and sustained progress. Scientifically the fifteenth century strikes us as distinctly inferior to the fourteenth, with the exception perhaps of certain fields such as surgery and anatomy. The second half of either century similarly falls off from its first. Giovanni da Fontana was still good enough for Pompilius Azalus to pass off on Charles the Fifth a century later. What medical writer of first rank is there in the second half of the fifteenth century? What trio at Venice around 1475 is there to compare with that of Leonard of Bertipaglia, Sante Ardoini, and Giovanni da Fontana around 1425? But there is no falling off in the occult arts. The fourteenth century closed with Antonius de Monte Ulmi and the fifteenth ends with Jerome Torrella. The interest in the occult, whether friendly or hostile, far overshadows any interest in the scientific in men like Pico della Mirandola, Bernard Basin, Pedro Garcia, Lefèvre d'Étaples, Ficino, Reuchlin, and Trithemius. For interest in nature we have to turn to Conrad Heingarter and Simon de Phares who also, however, were primarily astrologers. Alchemy has ceased, temporarily at least, from any scientific theorizing as to the relation of the elements and qualities and dropped to the popularizing repetitive level of Christopher of Paris and George Ripley. Had the Black Death and wars of Europe set back the clock? Were humanism and painting detracting—except in the case of a Leonardo da Vinci—from the pursuit of natural science and mathematics? Was the opening of the witchcraft delusion and persecution a gauge of the time's low scientific caliber? Or was it a fallow period, when men's minds were recovering their fertility, to be furrowed with tidings of new lands and peoples, and followed by the age of Vesalius and Copernicus? Then presently seeds that had lain dormant since the fourteenth century were, as Duhem has shown, to sprout and fructify in modern philosophy and science.

Frankly, it is not for this contribution towards modernity that we most prize these writings of two remote centuries which we have been at some pains to decipher and to set forth. We have taken them as we have found them and we esteem them for what they are in their totality, their fourteenth and their fifteenth century *complexio*—a chapter in the history of human thought. Read it and smile or read it and weep, as you please. We would not credit it with the least particle of modern science that does not belong to it, nor would we deprive it of any of that magic which constitutes in no small measure its peculiar charm. Perhaps it would be well to read it and think of what the future historian may say of the mentality and scholasticism of the present era and with what sympathy or antipathy he would be justified in regarding us.

APPENDICES

APPENDIX 39

MANUSCRIPTS IN CONTINENTAL LIBRARIES OF WORKS IN THE LULLIAN ALCHEMICAL COLLECTION

First are given brief tables of contents of manuscripts which are primarily composed of works of the Lullian alchemical collection. For fuller notices of the works contained in these and in other manuscripts one should refer to the second part of the appendix where the works are arranged alphabetically by brief titles. For manuscripts in British libraries one should refer to the catalogue of Mrs. Dorothea Waley Singer, and for printed editions to the notices in the twenty-ninth volume of the *Histoire littéraire de la France*. These are indicated in a chart which further shows whether there are continental manuscripts of the work in question and whether it is in the lists of Lullian alchemical works in the fifteenth century manuscripts, BM Sloane 75, fol. 185v, and FL Ashburnham 190, fol. 67r, in the *Conversatio philosophorum* of S. Marco VI, 215, of 1475 A.D., and in the early modern alchemical bibliography of Vatican Barberini 273. Works have commonly not been listed which it seemed certain were fabricated after 1500.

Berne A 78, membrane, 15th century
fols. 1r-24v, Lapidarium
25r-31v, Ars conversionis
32r-71r, Anima artis
72r-78v, Accurtatio
79r-92r, Apertorium
94r-v, Graphic alphabet and other figures
95r-134v, Tertia distinctio (Extracts from)
135r-141r, Repertorium
141v-145r, Cantilena
145r-148r, Aphorismi
148r-150r, Secretum de rectitudine aque in mercurium (probably not Lullian)
150r-154v, De intentione alchemistarum (Extracts from)
155-156, Anonymous notes
157r-169v, Testament, Extract from "per Petrum de Preziau"
170r-173r, Mercuria (incomplete)
174r-184r, Nobilis instructio (not Lullian)
184v-188r, De congelatione mercurii per herbas secundum Raymundum Lulii
188v, Figure of the Arbor secreti occulti
190r-196r, Investigatio secreti occulti
196v-198r, Codicillus (Extract)
198v-200r, Practica de triplici mercurio (perhaps an extract from some work of the Lullian collection)

FL Gaddi reliq. 174, 15th century, paper

fols. 1r-9r, Accurtatio
9v, figure of a furnace
10r-14v, Octo operationes
15r-21r, Ars magica
21v-46r, Anima artis
47r-65r, Practica
65v-66r, Alphabet
66r- Extracta ex quodam libro medicine magistri Raymundi Lulli
67r- Multiplicatio, followed by miscellaneous recipes
70r-v, blank
71r-99r, Practica
99r-116v, Mercuria

FN Palatine 792, 15th century, 220 fols.
fols. 2r-5v, Accurtatio
5v-9r, Ars magica
9v-33v, Codicillus
34r-57v, Quid sit materia lapidis?
58r-151r, Testamentum, Theorica
151v-187r, Practica de furnis
188r-209v, Practica
210r-213r, Mercuria
213v-217v, Liber de mercurialibus ad rubeum
218r-219v, Questionarium

FN II. iii. 27, 15th century, folio, pages facing given same number, verso and recto
fols. 1r-57r, Testamentum, Theorica
58r-70v, Practica
70v-75r, Mercuria
75r-82v, Practica de furnis
82v-90v, Brancharum
90v-r, Cantilena
91v-106v, Apparatus
106r-129v, Lapidarius
129r-157v, Codicillus
157v-171r, Donum dei
172v-173v, Practica leonis
173r-174v, blank, except for a note in a different hand
174r-226v, missing
226r-236v, figures and tables
236r-249v, Tertia distinctio
249v-258v, Questiones
258r-260v, Disputatio monachi
260v-263v, Questiones of Arnald of Villanova to the pope
263r-265r, Ars magica
266v-273v, Anima artis
273r-279r, Investigatio secreti occulti
279r-281r, Accurtatio
281r-286v, Ars operativa
286r-297v, Rosarius of Arnald of Villanova
297r-298v, Epistle of Arnald to king Robert
298r-308r, Gradibus magnae medicinae, De

FN II. iii. 28, 16th century, most of the component treatises seem to have come into existence after 1500 and will not be listed below alphabetically but are listed here to present a complete table of contents for the MS which, although written a century later, is in a sense a companion volume to FN II. iii. 27.
1r-12r, De vasis
13r-16r, Repertorium
17r-25r, Liber quartus et ultimus
26r-29r, Lux mercuriorum
30r-33r, Experimenta de praxi sermocinalis
34r-35r, Investigatio secretorum
40r-41r, De preparatione hominis
44r-v, Prima magia naturalis
46r-47r, Aque
48r-53r, Semita recta et Codicillum
54r-63r, Clavicula
64r-70v, Coelestis
72r-76v, Lucidarius
78r-82r, Sponsalitium
84r-88r, Natura et lumen
89r-115r, Angelorum et de conservatione humane vite
116r-125r, Secreto occulto, De
126r-127v, Secreto secundo, De

129r-133r, Lumen luminum de intentione alchimistarum
134r-136v, Opus abbreviatum
138r-147v, Secretum secretorum
149r-157v, Apertorium anime

Vatican 5846-5847, written 1496-1500 A.D. Tissue paper has been pasted over most of the leaves rendering them illegible.
fol. 1r, Que continentur in libro hoc
2r, Oratio scriptoris
3r-4r, Arnald of Villanova, Visio mystica
4v- Extracta quedam ex libro textus alchimie
13r-71v, Testamentum, Theorica
73r-90v, Practica
91v-120r, Mercuria
125r-162r, Codicillus
165r-180v, De intentione alchimistarum

Vatic. 5847
1r-29v, De quinta essentia of John of Rupescissa
30r-55v, De cura individuorum
55v- Aurum potabile, and other recipes
60r-67r, Questionarium
68r-82v, De gradibus magne medicine
83r-93v, Anima artis
94r-95r, Investigatio secreti occulti
95v-97v, Elucidatio testamenti
99r-101r, Repertorium
101r-102r, Anima artis
103r-104v, Lux mercuriorum
106r-109r, Accurtatio
109v-110v, Aphorismi
111r-112v, Aque
113r-122v, Magna medicina

BU 142 (109), 16th century
fols. 1r-52v, Experimenta
53r-70v, Investigatio secreti occulti
72r-81v, Lux mercuriorum
82r-84v, Questio quare palma congelat mercurium
85r-88r, Disputatio monachi
90r-102r, Apertorium
103r-109r, Ars magica
110r-115, Accurtatio (in French)
116r-118r, Ars operativa
119r-v, Plusieurs enseignements extraictz de la Theoricque de Raymond Lulle
121r-127r, In hoc presenti parvo opusculo sunt nonnulla parva secreta
At fol. 130r the date 1545 is mentioned.

Vienna 2474, 15th century, membrane
fols. 1-20r, Anima artis
20r-22r, Aque
22r-27r, Accurtatio
27v-29v, Alphabets
30r-31v, Investigatio secreti occulti
32r-41v, Apertorium

Vienna 5485, 15th century
fols. 1r-70r, Secretis naturae, De
72r-110v, Codicillus
111r-116v, Investigatio secreti occulti
117r-126r, Mercuria
126v-127v, Lux mercuriorum
128r-157v, John of Rupescissa, De consideratione quinte essentie

Vienna 5487, 15th century
fols. 1r-13r, Anonymous, "Septem sunt planete secundum cursum . . ."
14r-17r, Accurtatio
17r-21r, Ars magica
21r-33v, Anima artis
34r-44v, Lapidarius
47r-102r, Testamentum, Theorica
102v-104v, Alphabets
105r-106v, Octo operationes
107r-114r, Apparatus
115r-134r, Furnis
134r-135r, Cantilena

BN 7164, 15th century, paper
fols. 1r-12r, Ars operativa
15r-102v, Secretis naturae, De
103r-121v, Anima artis
123r- Hic ponuntur glose

129v, Incipit codicillus, but with this leaf the present MS ends.

BN 14008, 15th century
fols. 1r-18r, Anima artis
18v-20r, Alphabets and figures
22r-37v, Ars intellectiva
37v-41r, Accurtatio
41r-44r, Testamentum, Theorica; opening part only
45r-62r, Practica
62v-68v, Haly, Secretum alkymie
69r-103v, Tertia distinctio
104r-123r, Compendium ex Studio florenti (not Lullian)
124r-138r, Totum continens (not Lullian)
etc.

BU 169 (181), 15th century according to Frati; I have not examined this MS: Frati indicates no foliation.
1 De consideratione quinte essentie: "Prima figura . . ."
2 Eiusdem operis liber III: "Linee que veniunt . . ."
3 Questiones arboris philosophalis
4 Questiones disputate per monachum et Raymundum
5 Ortholanus de lapidis philosophici compositione
6 Epistola magistri Arnaldi de Villanova ad magistrum Iacobum de Tholeto
7 Lapidarius: "Dieu en vertu . . . / . . . iustum ab iniusto."
8 Practica: but Frati cites Manget for the Anima artis.
9 Practica que dicitur secunda pars secunde partis appertorii: "Tu in virtute . . . / . . . opere allegati."
10 Extractum de 3° libro nostro quinte essentie
11 Magia naturalis
12 Arnaldus de Villanova, Perfectum magisterium
13 Questiones facte a reverendo archiepiscopo Remensi ad predictum magistrum: "Primo queritur . . . / . . . diligens investigator."
14 Apertorium

BU 270 (457) 15th-16th century, vols. II-XXXVII: I have not seen these volumes but follow Frati's cataloguing of them.
II, 1 F. Raymundi Lulli Liber trium verborum
121r Practica: but with the incipit, "Accipe urinam . . ."
131r De secretis secretorum Raimundi Lulli: "Materia est id . . ."
V, 1 Artis intellectivae theorica
p. 64 Practica artis intellectivae
p. 103 Epistola accurtationis
p. 127 Investigatio secreti
p. 134 "Compendium artis naturalis"; apparently the Ars magica
p. 136 Anima artis
V, 2 Tertia distinctio
V, 3 Magnus lapidarius: "Sciens igitur . . ."
V, 7 Scala sapientiae: "Ut dicit . . ."
V, 8 Theorica testamenti
XII, 5 Codicillus
XII, 6 Liber quartus aquarum
XIV, 3 Mercuria
XVI, 5 Codicillus
XIX, 2 Scala sapientiae
XXIII, 1 Testamentum
XXVIII, 3 De intentione alchemistarum
XXXI, 2 Scala sapientiae
XXXIII, 3, pp. 52-68 Epistola accurtationis
XXXIV, 2, pp. 31-70 Anima artis
XXXVI, 3 Artis intellectivae theorica
pp. 47-74 Practica artis intellectivae
pp. 75-88 Epistola accurtationis
pp. 89-93 Investigatio secreti
pp. 94-111 "Compendium artis naturalis"; apparently the Ars magica
281r-511r, Ars intellectualis
521r-701r, Anima artis
701v-831r, Investigatio secreti occulti
831v-921v, Conservatio vitae
931r-971r, Elucidatio testamenti
971r-981r, Opus margaritarum
981v-1041v, Ars magica
1051v-1141v, Liber regis Haly

Florence Riccard. 942 (L.I.17; Lami, p. 270), 15th century
fols. 4r-11r, Soliloquium (probably not Lullian)
11r-15v, Lux mercuriorum
16r-21r, Accurtatio
21v-27v, De lapide phisico minerali

Accurtatio

FL Gaddi reliq. 174, 15th century, paper, fols. 1r-9r: "In virtute sanctissime trinitatis ipsiusque infinite bonitatis, Amen. Cum ego Raymundus de insula Maioricarum iam preteritis temporibus plures libros in arte transmutationum composuissem . . . / . . . Non puto accurtationes esse quas iam ista parva cedula tibi non declaravi. Elige ergo extra intentum. Laudas deum. Explicit epistola accurtationis lapidis benedicti magistri Raymundi de insula Mayoricarum."

FN Palat. 792, 15th century, fols. 2r-5v.

FN II, iii, 27, 15th century, fols. 279r-281r.

Florence Riccard. 942, fols. 16r-21r.

Vatic. 5847, 1500 A.D., fols. 106r-109r (old numbering, 323r-326r).

BU 164 (153), 15th century, membrane, fols. 118v-120v.

BU 138 (104), 1476 A.D., fols. 268r-270v.

Vienna 2474, fols. 22r-27r; "Raimundi accurtatio. In nomine domini. Cum ego Raimundus de insula. . . ." After the usual ending the date of copying is given as January 14, 1489.

Vienna 5230, fols. 229r-232r: "Incipit epistola accurtationis lapidis philosophorum ad regem Robertum. In virtute sancte trinitatis ipsiusque infinite bonitatis, Amen. Cum ego Raymundus de insula Maioricarum . . . / . . . Non puto accurtationes esse quas in ista parva cedula tibi non declaravi. Elige ergo ex ea intentum tuum. Laudamus deum omnipotentem. Explicit 1457 (or possibly, 1467) X Iunii Tridenti."

Vienna 5487, 15th century, fols. 14r-17r: "Epistola ad regem Robertum de libris suis. Cum ego Raymundus de insula Maioricarum . . . / . . . et lauda deum semper. Explicit epistola Raymundi de accurtatione lapidis philosophorum."

Vienna 5510, fols. 276r-278r.

Cassel Chem. Folio 13, 1478 A.D., fols. 104r-106r: "Explicit epistola

INDEX CHART TO WORKS IN THE LULLIAN ALCHEMICAL COLLECTION

Brief form of title	*HL 29 Page*	*DWS Item*	*Sloane 75*	*Ashb. 190*	*S. Marco VI, 215*	*Barb. 273*	*MSS*
Accurtatio	280–1	250		x	x	x	x
Ad amicum suum						x	x
Anima artis	282	253	x	x		x	x
Apertorium	277	258	x	x	x	x	x
Aphorismi		262				x	x
Apparatus							x
Aquae	287, 376		x	x		x	x
Ars conversionis	372						x
Ars intellectiva	286						x
Ars magica	288	257	x	x	x	x	x
Ars operativa	260	1004					x
Aurum potabile	374	265				x	x
Brancharum							x
Cantilena	248, 805						x
Clavicula	284					x	x
Codicillus	273	252	x	x	x	x	x
Conservatio humanae vitae	261		x	x		x	x
Cura individuorum							x
Donum dei							x
Elucidatio testamenti	277, 380					x	x
Experimenta	280, 384					x	x
Furnis, Practica de	248					x	x
Gradibus magnae medicinae, De							x
Intentio alchimistarum	278–9				x		x
Investigatio secreti occulti	376	252			x	x	x
Iste est modus		263					
Lapidarius	281, 379–80			x		x	x
Lux mercuriorum	284					x	x
Magna medicina	260						x
Mercuria	279	246		x		x	x
Mercuria ad rubeum	382	247					x
Potestas divitiarum	286						x
Practica	273	244		x		x	x
Practica leonis							x
Practica sermocinalis				x		x	
Questionarium			x			x	x
Quid sit materia lapidis							x
Repertorium	277	259				x	x
Secretis naturae, De (Tertia distinctio)	282, 287	255	x	x	x		x
Testamentum, Theorica	273	244	x	x	x	x	x
Vade mecum	280		x		x		

accurtationis lapidis benedicti magistri Raymundi de insula Maioricarum per me Conrad Kupfermanum anno 1478. . . ."

Copenhagen Gl. kgl. S. 1713, 15th century, fols. 6v-11: "Ars Raymundi Lulli de aquis preciosissimis. Cum ego Raymundus . . . / . . . membra hominis aggravata."

Copenhagen Gl. kgl. S. 3498, 15th century, fols. 168-174: "Cum ego Raymundus de insula Maioricarum . . . / . . . Elice ergo ex ea intentum et lauda deum semper."

Wolfenbüttel 3076, 15th century, fols. 25v-28v, and again at fols. 182v-185v.

Wolfenbüttel 3284, 15th century, fol. 129v: "Sequitur epistola accurtationis lapidis benedicti magistri Raymundi de insula Maioricarum."

BN 14008, 15th century, fols. 37v-40v: "Incipit epistola magistri Raymundi Lulii missa regi Roberto de accurtatione lapidis philosophorum. . . ."

BN français 19960 (once St. Germain lat. 1448), 15th century, paper, fols. 1r-5r: the text, all in Latin, opens as usual and ends, ". . . Elice hoc ex ea intentum laudans deum, Amen."

CLM 10590, 17th century, fols. 342-346. Rimini 77 (D.IV.19), 15th century, fol. 80.

BU 270 (457), V, 1, 103; XXXIII, 3, 52-68: XXXVI, 3, 75-88.

Berne A 78, fols. 71v-78v: rubric at end, "Explicit epistola accurtatoria lapidis benedicti magistri Raymundi Lulii. Hec Rome."

Ad amicum suum

FL Ashburnham 191 (123), 15th century, fols. 35r-47v: rubric, "Liber Raimundi ad amicum suum"; incipit, "Pater mi clementissime dixi ergo tibi quod oportet prius corpora in primam materiam reducere . . . / . . . Et cum ad hoc perveneris lauda Ihesum Christum creatorem altissimum super omnia que tribuit tibi, Amen. Explicit methodus directus, deo gratias."

CLM 10601, 16th century, fols. 1-40: Raymundi Lulii de lapidis dispositione ad amicum suum.

Anima artis

Berne A 78, 15th century, fols. 32r-71r: rubric, "Epistola seu compendium Raymundi"; incipit, "Fulgeat regis dyadema Roberti regis illustrissimi . . ."; fol. 33r, rubric, "Incipit liber eximii doctoris Raymondi Lulii quod est eius appertorium alkimie"; incipit, "In nomine

sancte trinitatis atque eterne unitatis incipit principium huius compendii quod nominamus animam transmutationis artis metallorum missum regi Roberto et nostrum lapidarium huius pretiosissimi artis. Iam autem superius allocuti recoluimus. . . ." The work appears to end at fol. 59v, ". . . qui trinus personaliter unicus essentialiter regnat per omnia secula seculorum. Amen"; followed by the rubric, "Finita est enim ars transmutatoria per magistrum Raymundum in preclaro studio Montispessulani regnante (fol. 60r) rege Roberto anno domini millesimo tricentesimo tricesimo tertio." But the subsequent pages contain the section on the making of gems, so that the work does not seem actually to end until fol. 71r, ". . . qui trinus est personaliter unus essentialiter regnans per omnia secula seculorum. Amen. Explicit compendium."

FL Gaddi reliq. 174, 15th century, fols. 21v-46r: rubric, "Practica magistri Raymundi de compositione lapidis philosophorum necnon lapidum pretiosorum per lapidis principia vegetabilis." Then, "In nomine sancte trinitatis et eterne unitatis incipit compendium huius principii quod cognominamus animam transmutationis artis metallorum missum regi Roberto . . . et lapidarium huius pretiosissime artis. Iam sepe et sepius attoniti recolimus multis et diversis modis practicandi . . . / . . . et unus essentialiter regnans per omnia seculorum secula. Explicit compendium magistri Raymundi Lulli."

FN II, iii, 27, 15th century, fols. 266v-273v: "Liber anime artis sive commentum codicilli divisus in tribus. . . . In nomine sancte trinitatis et eterne unitatis incipit compendium huius principii quod cognominamus animam transmutationis artis metallorum missum regi Roberto nostrum lapidarium huius pretiosissimi artis. Iam sepe et sepius allocuti sumus. . . ."

Florence Riccard. 942, fols. 52r-70r.

Vatic. 5847, 1500 A.D., fols. 83r-93v (old numbering, 293r-303v): "In nomine domini, amen. Incipit lapidarius Raimundi Lulii feliciter." An alphabet follows and then we read: "In nomine sancte trinitatis et eterne unitatis incipit compendium huius principii quod cognominamus animam transmutationis metallorum missum regi Roberto. Cum sepe et sepius alloquuti recolimus multis et diversis. . . ." *Ibid.*, fols. 101r-102r: "Incipit anima artis transmutatorie abbreviata. In nomine sancte trinitatis ac eterne unitatis, Amen. Cum multis et diversimodis hoc magisterium pertractavimus. . . ."

BU 164 (153), 15th century, fols. 90v-99v.

Vienna 2474, 15th century, membrane, fols. 1r-20r: "In nomine sancte trinitatis et eterne unitatis principium huius compendii quod nominamus animam transmutatorie artis metallorum incipit missum Roberto regi illustrissimo supra testamentum et codicillum et vademecum et lapidarium huius pretiosissime artis. Iam sepe et sepius alocuti . . . / . . . scriptum ac datum per Ramundum Lulli apud Montem Pessulanum anno domini CCCXXI."

Vienna 5487, 15th century, fols. 21r-33v: "Explicit compendium magistri Raymundi Lulii appellatum anima transmutationis artis metallorum."

BN 7164, 15th century, paper, fols. 103r-121v: Anima artis R. Lulli. "Fulgeat regis diadema Robertus regum illustrissime . . . / . . . Finit Raymundus librum istum in Monte Pesullano regnante rege Roberto anno ab incarnatione domini millesimo CCCXXI. Sequuntur forme vasorum."

BN 14007, 15th century, fols. 70r-80v: "Raymundi Lulii compendium quod anima transmutatorie artis omnium metallorum sive apertorium cognominamus missum regi Roberto super nostrum Testamentum Codicillum Vademecum et Lapidarium huius pretiosissime artis. Capitulum. Iam sepe et sepius allocuti recolimus . . . / . . . regnat in secula seculorum. Finita est enim ars transmutatoria per magistrum Raymundum in preclaro studio Montispesulani regnante rege Roberto anno domini 1333."

BN 14008, 15th century, fols. 1r-18r: mutilated at the beginning. Various so-called *Practica's* appear to be this in whole or part.

See BU 168 (180), fols. 184r-190r; BU 169 (181), No. 8; BU 270 (457), V, 1, 136; XXXIV, 2, 31-70; Ravenna 388, fols. 1-18.

Apertorium

Vienna 2474, about 1488 A.D., fols. 32r-41v: "Incipit apertorium Raimundi Lulii de Maioricha. Sapientes dixerunt quod non est nisi unus lapis . . . / . . . et sic de aliis omnibus similibus. Quere in testamento. Finis. In ultimo testamento Raimundus citat tertium librum apertorii. Videtur ergo adhuc plures esse libros. Parce lector quia ex malo exemplari."

BU 142 (109), 16th century, fols. 90r-102r: Apertorium abbreviatum Raymundi Lullii. "Sapientes dicunt quod non est nisi. . . ."

FN II, iii, 28, 16th century, fols. 149r-157v: "Incipit apertorium anime et clavis totius scientie occulte in omni transmutatione metallorum

et transmutatione lapidum et pro restituenda salute corporis humani ad Carolum. Incipit primum prohemium huius operis. Fili charissime, imperator celi et terre dominus potens. . . . Sequitur alterum prohemium de unitate lapidis deque eius natura custodia purgatione et virtute. Sapientes dixerunt quod non est nisi unus lapis . . . / . . . per secreta domine stature."

Berne A 78, fols. 79r-92r: "Incipit appertorium abreviatum Raymundi Lulii. Sapientes dicunt quod non est nisi unus lapis. . . ."

CLM 10590, 17th century, fols. 331-341.

BU 169 (181), 15th century according to Frati, item 14.

Aphorismi

Vatic. 5847, 1500 A.D., fols. 109v-110v (old numbering, 326v-327v): "Incipiunt anphorismi Raymundi Lulli feliciter. Aurum philosophicum est tactu rarius. . . ."

Berne A 78, fols. 145r-148r: "Incipiunt amphorismi operis philozophici alkimie. A aurum philosophorum . . . / . . . stultus nisi sic teneatur. Expliciunt amphorismi."

Apparatus

FN II. iii. 27, 15th century, fols. 91v-106v: "Incipit apparatus super testamentum Raimundi Lulii. In Christi nomine et beate virginis Marie incipit practica nostre apparatus triumphantis germine (?) compendiose editus ideo ingenti claroque principi Adoardo Anglicorum regi. Apparatus iste dividitur in quatuor principales operationes . . . / . . . permanens tingens consolidans. Explicit apparatus tertius." The fourth operation thus seems here omitted.

Vienna 5487, 15th century, fols. 107r-114r: "In Christi nomine et beate virginis nunc incipit practica nostri apparatus triumphantis gemine (?) compendiose editus ideo ingenti claroque principi Edwardo Anglicorum regi. Apparatus iste dividitur in quatuor principales operationes . . . / . . . ut presens figura hic manifestat. Deo gratias."

Aquae

Vatic. 5847, 1500 A.D., fols. 111r-112v: "Incipit tractatus de aquis qui Repertorium secundum aliquos dicitur. Et primo de aquis mineralibus. Fili, due sunt aque extracte ab una parte nature. . . ."

FN II. iii. 28, 16th century, fols. 46r-47r: "Incipit liber et tractatus de aquis Raymundi Lullii super Epistola accurtatoria ad regem Robertum. Rex serenissime, sunt duo aque extracte ab una parte nature. . . ."

FL Ashburnham 190, 15th century, fol. 57v: "Fili, due sunt aque. . . ."

Vienna 2474, 15th century, fols. 20r-22r: "Fili, due sunt aque extracte ab una parte. . . ."

BN 14007, 15th century, fols. 82v-83v: Tractatus de duabus nobilissimis acquis, "Fili, due sunt aque existentes ab una parte. . . ."

For the *Liber quatuor aquarum* see *Ars conversionis* below.

Aquis et oleis (De)

See *Ars operativa*

Ars conversionis

Berne A 78, 15th century, fols. 25r-31v: "Reverendo B. salutem et pacem iuxta ritum salvatoris. Intuita namque littera tua breviter cognovimus paupertatis te vinculo esse submissum et nonnullis miseriis oppressum. . . ." After this prefatory letter the text proper opens: "Deus cum tua benedictione incipit liber iste seu ars conversionis mercurii et saturni in aurum et argentum ac conservationis humani corporis. Presens liber dividitur (fol. 25v) in quatuor partes . . ." The work ends, ". . . visci squilla. Et sic ad honorem dei et ad utilitatem fidelium finitur tractatus iste utilis editus Rome anno domini 1332 per Raymundum Lulii etc. Explicit."

Wolfenbüttel 3076, 15th century, fols. 31r-33r, prefixes to the prefatory letter the titulus: "Incipit ars conversionis martis (*sic*) et saturni in solem et lunam et conservationem (*sic*) humane nature."

BN 12969, 1501 A.D., fols. 27r-30r: "Incipit liber quatuor aquarum magistri Raymundi Lulii," but then, "Reverendo patri salutem et pacem iuxta ritum salvatoris" etc. and "Deus cum tua beatitudine incipit liber iste seu ars conversionis mercurii et saturni in solem et lunam" etc. The text ends as in Berne A 78, ". . . visci squilla," but then we read, "Illud est extractum a quodam libro Raymundi quem fecit Rome anno domini 1322 Christi. Explicit. Deo gratias." Hauréau, *Notices et extraits*, II, 141-143, noted that this text was identical with the *Ars conversionis*.

BU 270 (457), XII, 6: Liber quartus (*sic*) aquarum, "Reverendo patri salutem . . . / . . . patientia virtus."

Ars intellectiva

BN 14008, 15th century, fols. 22r-37v: Magica lapidis philosophorum, incipit, "Sunt multi errantes in hoc mundo universali qui deviant ab

opere philosophali . . . / . . . Explicit magica lapidis philosophorum edita a magistro Raymundo Lulii."

BU 270 (457), 15th-16th century, V, 1, pp. 1-102; also XXXVI, 3, pp. 1-74: divided into a Theorica, "Sunt errantes . . . / . . . deum omnipotentem"; and Practica, "Corruptio et depuratio . . . / . . . cursum naturae."

BU 524, 15th century, fols. 70r-116r: "Raymundi Lulli Ars intellectiva. Multi sunt erratici . . . / . . . ab eorum corruptione."

Florence Riccard. 942, fols. 28r-51r, Ars intellectualis seu magica parva Raimundi Lullii. After a preliminary table of 34 rubrics the text opens, "Sunt errantes multi . . ."

Ars magica

Vienna 5487, 15th century, fols. 17r-21r: "Incipit compendium artis magice secundum cursum nature reformatum . . . / . . . inceratur cum sale martis vel veneris. Explicit magica Raymundi."

FL Ashburnham 190, 15th century, fols. 54r-57r: "Magia sive magica Raymundi Lulii. Incipit compendium artis magice secundum cursum nature reformatum virtute cuius sine elongatione vel elevatione mentis vel corporis videre poteris spiritus figuratos. . . ." The page on which this appears has then been crossed out, and at fol. 54v we begin again: "Practica Raymundi de vero lapide," in a more recent hand above the old heading, "Compositio aque vite," and the incipit, "Recipe nigrum nigrius nigro . . ." of what is usually the third chapter of the *Ars magica*. Its remaining chapters (4-25) then follow in their usual order, and the work ends, ". . . . sine quo nihil fit. Explicit compendium artis magie Raymundi Lulii de transmutatione secreta metallorum."

FL Gaddi reliq. 174, 15th century, fols. 15r-21r: rubric, "Practica magistri Raymundi de insula Mayoricarum de compositione lapidis philosophorum necnon lapidum pretiosorum per lapidis principia vegetabilis et mineralis." Then, "In nomine sancte trinitatis et eterne unitatis incipit compendium anime transmutationis artis metallorum et lapidarii huius pretiosissime artis. Compositio aque vite. Accipe nigrum nigrius nigro . . . / . . . inceratur cum sale martis veneris. Deo gratias. Explicit."

FN Palat. 792, 15th century, fols. 5v-9r: "Incipit ars magica Raymundi ad regem Adoardum Anglorum regem. Incipit compendium artis magice secundum cursum nature reformate virtute cuius sine elongatione a Deo necnon sine elevatione mentis vel corporis videre poteris spiritus figuratos in aere condempsatos in forma monstrorum et diversorum animalium et hominum humanorum qui vadunt sicut nubes modo huc modo illuc. Et hoc solum fit ex principiis naturalibus . . . / . . . ut prius donec levissime fluat nostri mercurii fuga. Explicit ars magica Raymundi Lugli." This MS seems to go no farther than chapter 23 in the text as printed in Manget.

FN II, iii, 27, 15th century, fols. 263r-265r: "Liber compendii artis magice. Incipit compendium artis magice secundum cursum nature reformatum . . . / . . . inceratur cum sale martis vel veneris. Explicit magica Raymundi."

Florence Riccard. 942, fols. 98v-104v.

BU 142 (109), 16th century, fols. 103r-109r: "Magia naturalis. Compositio aquae nostrae. Accipe nigrum nigrius nigro. . . ."

Vienna 12834, 16th century, fols. 43r-54r: "Superadditio totius operis et intentionis R. Lullii et intitulatur magica ars naturalis."

BU 169 (181), No. 11: BU 270 (457), V, 1, 134 and XXXVI, 3, 94-111.

Ars operativa

FL Ashburnham 1448, 15th century, fols. 35r-49r, where it is preceded by Rupescissa on the fifth essence. "Tractatus Raymundi de aquis et oleis incipit. Cum ego Raymundus Ylerde existens essem rogatus a quibusdam caris . . . / . . . item hoc sperma bibitum alleviat membra hominis aggravata. Explicit ars operativa magistri Raymundi, Amen."

FN II, iii, 27, 15th century, fols. 281r-286v, "Incipit ars operativa Raymundi. Cum ego Raymundus dudum affectuose rogatus fuissem a quibusdam meis caris . . . / . . . bibitum alleviat membra hominis aggravata. Amen."

BN 7164, 15th century, fols. 1r-12r, "Cum ego Raymundus dudum Ilerde existens rogatus affectuose a quibusdam caris meis . . . / . . . hoc sperma bibita alleviat membra hominis aggravata. Explicit ars operativa Raymundi deo gratias."

BL Ashmole 1444, 15th century, fols. 1-16, Raymundi Lulli libellus de 'medicinae artis occultis,' ac de compositione virtutibusque aquae vitae et aliarum aquarum. "Cum ego Raymundus dudum Ellerde episcopus rogatus a quibusdam caris . . . / . . . quicquid hec medicina non curat numquam curabitur. Explicit (*sic*) secreta Raymundi et aliorum medicorum probata." Noted by Batista y Roca, *Catàlech*

de les obres Lulianes d'Oxford (1916), p. 20, but not by DWS who probably regarded the work as medical rather than alchemical and so omitted it.

BU 142 (109), 16th century, fols. 116r-118r, has the title, "Ars operativa," but a different incipit, "Hoc opus excellentissimum est auri potabilis pro medicina corporis humani . . ." and possibly should rather be associated with the work on potable gold ascribed to Lull.

CLM 10601, 16th century, fols. 41-65.

Aurum potabile

BN 7150, 16th century, folio, 30 lines to a page, fols. 34r-38v: Liber ad faciendum aurum potabile, or, De compositione et virtutibus auri, opening, "Fili doctrinae, postquam ego Raymundus Lullus vobis declaravi in precedenti tractatu. . . ."

Vatic. 5847, 1500 A.D., fol. 55v: "Aurum potabile sic fit secundum Raymund Lul. . . ."

Brancharum

FN II. iii. 27, 15th century, fols. 82v-90v: "Brancharum testamenti. Nunc dicemus per viam practice aliquos ramos tincture in quibus fili quiescere poteris et solatiari cum audiutorio de A. Tu fili scire vis transmutamentum proprii corporis lunaris cum clara practica. . . ."

Cantilena

FN II. iii. 27, 15th century, fol. 90v-r: "Cantilena. Amor me facit rimare . . . / . . . Quae sunt providentia et karitas. Finis cantilenae. Finis trium essentialium operum Testamenti magni Raimundi Lulii editi inclito Odoardo regi Anglie scilicet prudentie karitatis atque patientie videlicet forme maioris et minoris partis secundeque una cum libro mercuriorum et partis tertie theorice miste occulta practica. . . ."

Vienna 5487, 15th century, fols. 134r-135r: "Amor me facit rimare . . ."

BU 523 (927), 15th century, fol. 85v: "Amor nos facit hoc rimari. . . ."

Berne A 78, 15th century, fols. 141v-145r: rubric, "Incipit dictamen venerabilis doctoris nostri Raymundi Lulii super compositionem lapidis philosophorum"; incipit, "Amor mo asso rigmar"; ends, "Baillat philosophicalement"; rubric, "Explicit carmen."

Clavicula

BN 7165, 1542 A.D., fols. 24r-30r: "Nos appellamus hoc opus nostrum claviculam. . . ."

CLM 25110, 15th century, fols. 171-191: Clavicula sive repertorium. I have not seen the MS to identify the treatise more exactly.

FN II. iii. 28, 16th century, fols. 54r-63r: "In sancte ac individue trinitatis ac perfecte unitatis nomine, Amen. Incipit Clavicula secreta divi Raymundi Lulli et ista clavicula dicitur clavis aurea . . . missa ad Carolum principem Anglorum. Rex et fili, oportet ut habeas mercurium duorum luminarium depuratum per sublimationem. . . ."

Codicillus

Copenhagen Gl. kgl. S. 236 F, 1429 A.D., fols. 55-80 (old numbering, 57r-82v, 82v-83r): "Deus in virtute trinitatis qua unitas divinitatis tue non leditur nec confunditur in aliquo incipimus presens compendium quod aliter vade mecum de numero philosophorum sive clausula testamenti per modum codicilli nominari iubemus . . . / . . . ad libitum dum tamen intelligas magisterium. Explicit liber magistri Raymundi Lulii qui vade mecum sive clausula testamenti nuncupatur scriptus et collectus . . . per manus Walteri Vallreuere anno domini M° CCCC° vicesimo nono mensis martii die vicesima quarta hora quasi vesperarum."

FN II. iii, 27, 15th century, fols. 129r-157v: "Incipit vade mecum Raimundi sive ars compendiosa capitulum primum. Deus in virtute tue sancte trinitatis in qua unitas tue divinitatis non est in aliquo vulnerata nec confusa incipiamus presens compendium quod aliquo modo apertorium vel vade mecum de numero philosophorum vel clausula testamenti per modum codicilli volumus nominari . . . / . . . ad libitum dum tamen intelligas magisterium." In 73 caps.

FN Palat. 792, 15th century, fols. 9v-33v.

Vatic. 5846, about 1496 A.D., fols. 125r-162r.

Vienna 5485, 15th century, fols. 72r-110v.

BN 7163, 15th century, fols. 1-60v.

BN 14007, 15th century, paper, fols. 14r-49v: this MS contains both genuine works of Lull on his art and works on alchemy attributed to him, which is somewhat unusual.

CLM 25110, 15th century, fol. 199 *et seq.*: Compendium codicilli. Not having seen this MS, I am uncertain if it is the *Codicil* or perhaps the *Anima artis*.

BU 270 (457), XII, 5 and XVI, 5.

Berne A 78, 15th century, fols. 196v-198r: rubric, "Ista est clausula codicilli seu vade mecum que est de forma circulorum sub totius operationis intentione secreti"; incipit, "Totum autem secretum et

operandi modus in rotatione circulorum consistit . . ." which are the opening words of cap. 71 of the *Codicil.* Closing rubric: "Explicit clausula compendii secreti codicilli que alias dicitur vade mecum de numero philosophorum. . . ."

Florence Riccard. M.I.xxxii (Lami, p. 270): "Compendium vel vade mecum de numero philosophorum sive clausula Testamenti aut Codicillus Raimundi Lullii de Insulis Balearibus vel Maiorica."

Conclusio summaria

See *Repertorium.*

Conservatio vitae humanae

Vienna 11342, 1516 A.D., fols. 34r-41r: "Incipit liber Raymondi de conservatione vite humane. Intendimus componere rem admirabilem tactam ab Ypocrate Galieno . . . / . . . non invenitur nisi in vero auro puro de minera creato. Iussu dei cuius nomen sit benedictus, Amen. Explicit liber Raymondi Lulii de conservatione vite humane Rome anno 1516 die 17 mensis octobris."

BN 15095, 17th century, fol. 307 *et seq.*

Padua, Antoniana XXIII, 617, 17th century: "Intendimus componere rem admirabilem . . . / . . . vegetabile ad infinitum."

Florence Riccard. 942, fols. 83v-92v.

Cura individuorum

Vatic. 5847, about 1500 A.D., fols. 30r-58r (old numbering, 231r-249r): "Incipit libellus de cura individuorum Raimundi Lulii." Only in the margin and table of contents (Vatic. 5846, fol. 1r) is it called "Tertius liber de quinta essentia." It opens, "Ista regula infrascripta datur de lineis que oriuntur ab R.S.T.U. arboris philosophicalis. . . ."

See also *Tertia distinctio.*

Disputatio monachi

Raymond's disputation with the monk, which properly forms the epilogue of the *De secretis naturae* or *Tertia distinctio,* is found alone in the following MSS:

BU 142 (109), 16th century, fols. 85r-88r: "Dum R. librum composuit. . . ."

BN 12969, 1501 A.D., fols. 33v-34v: "Sequitur disputatio Raymundi Lulii cum quodam monacho. Dum Raymundus librum composuit . . . / . . . Finivit librum istum Raymundus Parisius anno domini 1333 incarnationis. Deo gratias."

Donum dei

FN II. iii. 27, 15th century, fols. 157v-171r: "In nomine sancte trinitatis et eterne unitatis incipit liber admirabilis nominatus Donum dei (in the margin is added, 'Sive de intentione alchimistarum') et qui de merito numquam deberet venire ad manus indignantis quia secreta profonda numquam debent revelari homini indigno. Liber primus. Laus sit deo qui gratiam nobis contulit philosophiam reducendi septem corpora . . . / . . . et ibi securus quocunque teris."

BU 271 (458), transcript of 1511 A.D., first item: "Liber qui donum dei dicitur, alias mixtionum tractatus Iohannis Dastini Anglici. Laus sit deo . . . / . . . quicumque volueris."

S. Marco, VI, 215, 1475 A.D., fols. 26v-64v: is the same work ascribed to John of Damascus. See the end of the chapter on John Dastin for some further account of it.

A different work in twelve chapters follows the *Accurtatio* "of master Raymond of the island of Majorca" in the following MS:

Wolfenbüttel 3284, 1500 A.D., fols. 130r-138v: "Incipit liber intitulatus preciosissimum donum dei. Qui desiderant nostre philosophie scientie maiorem cognitionem verissimam habere. . . ." On fol. 131r the introduction ends and a table of the twelve chapters is given. Each chapter then occupies the top of a page and a colored figure the lower half until at fols. 137v-138v come three solid pages of concluding text. Then, "Explicit liber qui intitulatur preciosissimum donum dei sub anno domini 1500 in octava apostolorum Petri et Pauli." Although Heinemann's catalogue ascribes this work to Raymond Lull, I saw nothing in the MS itself to that effect. The same work occurs anonymously and without title but with similar illustrations in another MS:

Wolfenbüttel 3772 (77.2, Aug. 8°), 15th century, fols. 1r-14v: opening, "Qui desiderant artis philosophice scientie maiorem cognitionem verissimam habere. . . ." At fol. 1v, "Iohannis Andree in aditionibus speculi super rubrica de falsis," is quoted concerning Arnald of Villanova's making rods of gold. Other citations are of Arnoldus himself, Aristotle, Geber, Ortolanus, Thomas Aquinas, Auctor, "Donum Dei intitulatus," the *Turba,* and "Speculum," which is a frequent rubric. But there seems to be no justification for Heinemann's catalogue giving the treatise itself the title, "Speculum alchymie."

See *Intentio alchimistarum.*

Elucidatio testamenti

Vatic. 5847, 1500 A.D., fols. 95v-97v (old numbering, 305v-307v): "Elucidatio testamenti Raymundi Lulii ad regem Robertum. Tu in virtute de A, princeps serenissime, recipe . . . / . . . et regnat per omnia secula seculorum, Amen. Finita est ars transmutationis per magistrum Raymundum Lulium in preclaro studio Montispessolanis (*sic*) anno domini M°CCC^mo°XXXIII°."

S. Marco VI, 215 (Valentinelli, XVI, 4; once Nani 56), 1475 A.D., fols. 216v-224v: "Elucidatio totius testamenti ad regem Edoardum. Tu in virtute dei. . . ."

Florence Riccard. 942, fols. 93r-97r.

Epistola accurtationis, or, *ad regem Robertum*

See *Accurtatio*.

Experimenta

BU 142 (109), 16th century, fols. 1r-52v: "Liber experimentorum Raymundi Lulii et sociorum suorum. In nomine individue trinitatis patris et filii et spiritus sancti, Amen. Ego Raymundus Lulius societates ut evangelicos viros. . . ."

Cassel Chem. Quarto 34, 1594 A.D., fols. 2-65r: "Experimenta Lullii et sociorum eius. Accipe tartarum utriusque vini . . . / . . . opusculum optato fine claudatur anno MCCCXXX. Dei optimo maximo semper honor et gloria, Amen."

The following seem to be different texts:

FN II. iii. 28, 16th century, fols. 30r-33r: "Incipit liber experimentorum de praxi sermocinalis et sublimandi corpora in primam materiam traditus Eduardo regi per Raymundum Lullum. Naturalem evacuationem corporum a suis spiritibus, rex serenissime . . . / . . . et habes sal aque vite sine quo nihil fit et patet inferius figura vasis pro facienda dicta preparatione. Figura vasis."

CLM 10590, 17th century, fols. 311-330: De viginti quatuor experimentis totius naturae creatae, opening, "Raymundus volens se contristari. . . ."

CLM 27000, 17th century, fol. 275 *et seq.*: Liber experimentorum sive apertorium. This is presumably the *Apertorium*.

Vienna 12834, 16th century, fol. 1r-44r: Secreta totius astrologiae, alias liber experimentorum. "Ad habendam scientiam experimentorum quorum effectus causatur ab influentiis coeli sive planetarum

breviter est sciendum quid sit zodiacus. . . ." This treatise is not alchemical at all but applies Lullian principles to astronomy and astrology.

Furnis (Practica de)

As has been pointed out in the text, this sometimes is embodied in the Book of Mercuries: see *Mercuria*. It is given separately in:

FN Palat. 792, 15th century, fols. 151v-187r: rubric in top margin, "De practica ———— (a word which I could not make out) de fornis seu fornacibus." Incipit, "Fili, ad componendum dictam medicinam. . . ." The work closes with the colophon giving the date of composition of the *Testament* in 1302 at London which has been quoted in the text.

In the two following MSS it is not called *Practica de furnis*.

FN II. iii. 27, 15th century, fols. 75r-82v: "Incipit liber tertius testamenti. Fili, ad componendum dictam medicinam . . . / . . . que sunt instrumenta generationis et corruptionis, deo gratias, amen."

Vienna 5487, 15th century, fols. 115r-134r: "Practica testamenti Raymundi Lulii. Fili, ad componendam dictam medicinam. . . ." It ends with the colophon dating the *Testament* at London in 1332.

BU 523, 15th century, fols. 38v-85r, is also, I infer from Frati's catalogue, the *Practica de furnis*.

Gradibus magnae medicinae (De)

Vatic. 5847, 1500 A.D., fols. 68r-82v (old numbering, 273r-287v): The above title appears only in the top margin in a later hand and in the preliminary table of contents, now to be found in Vatic. 5846, fol. 1r. "Ex quolibet non fit quodlibet sed determinatum ex determinato quia nulla est generatio congrua nisi ex convenientibus . . . / . . . depurat multiplicat et conservat. Benedictus igitur deus gloriosus qui talem et tantam tribuit hominibus facultatem, Amen. Laus et gloria redemptori et domino nostro Iesu Christo eiusque matri et domine nostre Marie semper virgini gloriose quorum nomina benedicantur in evum et ultra, Amen."

FN II. iii. 27, 15th century, fols. 298r-308r: "Rosinus Arnaldi," but with the above incipit, "Ex quolibet non fit quodlibet sed determinatum. . . ." There are seventeen chapters, the last closing, ". . . Ymo sanguinem supermodum multiplicat et conservat. Amen, deo gratias."

Wolfenbüttel 3721, paper, 1467 A.D., fols. 97-137: has the same incipit, but at the close we read, "Explicit rosa aurea anno domini

MCCCClxvii in crastino Thome apostoli per me Heinricum Traub presbiterum et plebanum in Hausen in Valle Lachin sita." No author is named.

Intentio alchimistarum

Vatic. 5846, 1497 A.D., fols. 165r-180v (old numbering, 25r-40v): "Non obstante quod hec ars sit pars philosophie naturalis est in speciale donum dei. . . ."

Vienna 11342, 1515 A.D., fols. 111r-30v. The incipit is not "Posteaquam per valde longum tempus . . .," as HL 29, 278-279 implies, but, "Non obstante quod hec ars sit pars philosophie naturalis. . . ." The work ends, ". . . et panem celestem ad manducandum suis solis fidelibus contribuit, Amen. Finis. Explicit liber de intentione alchimistarum magistri Raymondi Lulii Rome anno 1515 die 21 mensis Decembris sub Leone decimo pontifice maximo."

In BU 270 (457), 15-16th century, vol. XXVIII, anonymous, although various other works are ascribed to Lull in the volumes of this collection: "Non obstante quod . . . / . . . intelligas magisterium."

Berne A 78, 15th century, fols. 150-154v: "Ista que sequuntur extracta sunt ex libro qui dicitur liber de intentione alkymistarum magistri Raymundi Lulii."

The following appears not to be the same treatise:

FN II. iii. 28, 16th century, fols. 129r-133r: "Incipit compendium et liber lumen luminum dictus Raymundi Lullii de intentione alchimistarum ad regem Eduardum et quomodo lapis philosophorum componitur in hoc opusculo continetur. Rex serenissime et amantissime fili, hec scientia non tractat nisi de . . . / . . . in practica sua dicemus. Typus dicti arboris (the figure is not drawn in). Explicit Compendium luminis luminum et de intentione alchemistarum." See HL 29,375 for a somewhat similar incipit from CLM 10493.

See *Donum dei.*

Investigatio secreti occulti

FN II, iii, 27, 15th century, fols. 273r-279r: "Liber de investigatione secreti occulti. Quia homo est magis nobile animal de mundo . . . / . . . fit de igne communi in tripode secreto. Adoarde propter tuum amorem et ad multiplicationem fidei chatolice et ad honorem beate virginis Marie perficit magister Raimundus in Avinione in cenobio fratrum predicatorum istum tractatum de investigatione secreti occulti Celestino suo discipulo anno domini M°CCC° nono."

Florence Riccard. 942, fols. 70v-83r.

BN 7163, 15th century, fols. 61r-72v, where the text seems to break off unfinished; fols. 66v and 73-75 are left blank. "De investigatione occulti secreti liber editus a magistro Raymondo Lulii nature archanorum interprete verissimo. Quia homo est magis nobile animal de mundo. . . ." At fol. 67r, "Recipe urinam xii puerorum virginum," whereas only at fol. 68v, "Incipit 3a pars . . .," reversing the usual order.

S. Marco VI, 215, 1475 A.D., fols. 206r-216r, opening, "Alchimia est ars . . ." which resembles the incipit of one of the *Practica's* ascribed to Raymond.

BU 142 (109), 16th century, fols. 53r-70r: De investigatione secreti occulti. "Alchimia est scientia artificialis ex naturalibus principiis . . ." This, too, is not the usual incipit.

Partial versions are represented by BM Harley 5399, 15th century, fols. 39-44v, for which see DWS I, 234-235, under No. 252, and by the following:

Vatic. 5847, 1500 A.D., fols. 94r-95r (once 304-305r): "Scrutatio sive investigatio breviloqua occultorum secretorum magistri Raimundi super omne magisterium operis maioris quod a philosophis intitulatur Vade mecum et sepius dictum est Clausula testamenti ad regem Odoardum in capitulo quod incipit, 'Partus vero terre etc.' Et in ista practica totius magisterii semita demonstretur per modum alfabetalem ita quod per quamlibet litteram. . . ." An alphabet then follows, only after which comes the usual incipit of the third part, "Ista est tertia pars. . . ." The tract closes, ". . . fac proiectionem sicut superius dixi tibi de liquore etc. Explicit hoc opusculum deo gratias amen."

Vienna 5485, 15th century, fols. 111r-116v: "Incipit tractatus scrutationis sive investigationis occultorum secretorum eiusdem Raymundi Lulli super omne magisterium operis maioris quod per philosophos intitulatur Vade mecum de numero philosophorum et sepius dictum est Clausula testamenti ad regem Eduardum in capitulo quod incipit, 'Partus vero terre etc.' Ista est practica totius magisterii que comprehenditur in secunda parte istius libri ubi monstratur per figuram alphabetalem ita quod per quamlibet litteram significatur unum principium ad evitandum prolixitatem scripture utque in figura arboris philosophie. Nunc vero propter ignaros dictum alphabetum volo de verbo ad verbum declarare sicut videbitur in practica in-

ferius posita. Practica huius tertie partis. . . ." At fols. 112r-113v intervenes a "Praxis secretissima extracta ex libro Raymundi dicto de secreto vegetabili."

Vienna 2474, 1488 A.D., fols. 30r-31v: "Practica secreti occulti de lapide animali. Ista est tertia pars que est de practica huius secreti quod est finis investigationis huius compendii . . . / . . . tibi dixi de liquore. Explicit deo laus die Mercurii octavo mensis Octobris 1488."

FN II, iii, 28, 16th century, fols. 34r-35r: "Incipit investigatio secretorum divini Raymundi Lullii que est practica totius scientie investigationis huius compendii ad serenissimum regem Odoardum Anglorum. Nunc rex serenissime est tempus si me intelligas . . . / . . . qui quo magis stabit in igne eo plus valebit. Explicit." This is at least a garbled version.

BU 270 (457), V, 1, 127: "Ista est secunda pars . . . / . . . plus valebit." *Ibid.*, XVI, 3, "Alchimia est ars . . . / . . . cadat in medicinam," may be identical with S. Marco VI, 215, listed above.

Berne A 78, 15th century, fols. 190r-196r: "Incipit tractatus de investigatione secreti occulti Raymundi Lulii cuius (?) causa brevitatis dimissa theorica sequitur practica etc. et primo de alphabeto et arbore. . . ."

Lapidarius

It is difficult to settle on an incipit for this work. HL regarded "Et primo fili tibi dicemus . . ." as usual and "Omissis preambulis necessariis in theorica . . ." as exceptional, but the latter occurs more often in the MSS I have seen, while sometimes a pious invocation or titulus opening, "Deus in virtute tue trinitatis sancte . . ." comes first of all. Vatican Barberini 273, fol. 211r, gives "Et fili primo indiges . . ." as its incipit. It would appear from Berne A 78 and Wolfenbüttel 3076 that "Omissis preambulis . . ." are the opening words of the professed translator, and "Et primo fili . . ." those of the first part of the text proper on theory.

Berne Stadtbibliothek A 78, 15th century, membrane: fol. 1r, rubric, "Hic incipit lapidarium Raymundi Lulii et primo theorica"; incipit, "Deus in virtute tue trinitatis sancte incipio tractare generationem lapidum pretiosorum per artem . . ."; rubric, "De principiis spiritualibus"; incipit, "Et primo filii (*sic*) tibi dicimus quod necessarium est scire et intelligere." fol. 4v, rubric, "Hic incipit secunda pars lapidarii que est practica et primo de aqua prima"; incipit, "Tu filii in virtute sancte trinitatis accipias de aqua mercurii . . ." fol. 24v, desinit, ". . . istam aquam potes cotidie semper et omnibus

temporibus portare et custodire quantum reperi tantum scribendo transtuli"—here the professed translator appears to speak. "Alias experientias quas hic non posuit queras in testamento et appertorio artis."

FL Ashburnham 190, 15th century, fols. 58r-63v: "Lapidarius Raymundi Lulii. Omissis preambulis necessariis in cronica (*sic*) et que ponit auctor profundissime, ad profundum (*sic*) transeo quia habet librum transferre in latinum de lingua catalanorum. Non obmitto tamen quod auctor dicit quod virtus mineralis est communis lapidibus et metallis et tota divina. . . ." Just where the treatise ends is a little uncertain. On fol. 63v we have the treatments of the balasius, beryl, and "opus margaritarum" which usually end the work. Lullian alphabets follow at fol. 64r; at fol. 64r is a paragraph on "Formatio perlarum"; on fol. 65v the *Lapidarius* is twice cited as if by some other work. But at fol. 65v we read, ". . . Et sic est finis ad dei laudem et honorem. Residuum queratur in 2° capitulo libri."

FN II, iii, 27, 15th century, fols. 106r-111r: "Lapidarius Raymundi foeliciter incipit. Virtus mineralis est communis lapidibus et metallis . . . / . . . per modum quem diximus tractatus lapidarii, et sic est finis ad laudem dei, Amen. Finis lapidarii." A note then follows which says, "Notandum est scilicet invenies hanc materiam pretiosorum lapidum in tribus diversis libris idest in libro quinte essentie in anima artis et in presenti libro lapidarii que est de essentia testamenti quos sapienter rimare te oportet."

Vienna 5230, 1467 A.D., fols. 232v-238v: "Iesus. Lapidarius Raymundi. Deus in virtute tue trinitatis sancte incipit generatio lapidum. Obmissis preambolis necessariis (in) theorica que ponit autor profundissime ad proximum transeo et maxime quia hunc librum transfero in latinum de (lingua) chatalanorum, non tamen obmitto quod autor dicit quod virtus mineralis inest verbis (*sic*) lapidibus et metallis. . . ." After treating of the berillus, the work ends, "Explicit lapidarius Raymundi magici 1467 16 Iunii."

Vienna 5487, 15th century, quarto, fols. 34r-44v: "Omissis preambulis necessariis in theorica que ponit actor profundissime ad proximum transeo ac maxime quia hunc librum transfero in latinum de lingua Catalanorum. Non obmitto tamen quod actor dicit quod virtus mineralis est communis lapidibus et metallis et tanta divina. . . ."

Wolfenbüttel 3076, 15th century, quarto, fols. 13r-22v: in the top margin, "Appertorium magistri Raymundi Lulii de compositione

lapidum preciosorum et eius lapidarium abbreviatum." The text proper opens, "Deus in virtute tue sancte trinitatis incipit liber generationis lapidum magistri Raymundi Lulii. Omissis preambulis necessariis et theorica . . ." etc. Soon the first part opens, "Et primo fili tibi dicimus. . . ." The closing words are, ". . . cotidie semper et in omnibus temporibus."

BU 20, 15th century according to Frati, item 2, mutilated.

BU 169, 15th century, item 7.

BU 270 (457), V, 3: "Magnus lapidarius Raymundi Lullii. Sciens igitur . . . / . . . per omnia secula seculorum, amen."

Lucidarium

See *Elucidatio testamenti.*

Lux mercuriorum

Vienna 5485, 15th century, fols. 126v-127v: Raymundi Lulii liber de lucibus mercuriorum. "In virtute de A accipe B album et odoriferum ut in libro nostro quinte essentie plenarie diximus . . . / . . . Y athanor, Z rectificatio. Finis libri lucis mercuriorum."

Vatic. 5847, 1500 A.D., fols. 103r-104v (old numbering, 317-318v): "Raymundi Lulii de insula Maioricarum liber lucis mercuriorum feliciter incipit. Iamdudum rex serenissime de transmutatione omnium metallorum locuti sumus. . . ." An alphabetical tree with explanations of its letters occupies most of the page, and only at fol. 103v do we find the incipit given in the other MS: "Tu igitur in virtute de A. accipe B. clarum et odoriferum. . . ." The work ends: "Sufficit ergo tibi, rex serenissime, hoc breve opusculum quod ita vulgari sermone transmittimus serenitati tue ad hoc ut fides christiana augmentatur. Finis."

Florence Riccard. 942, fols. 11r-15v, opens and closes like Vatic. 5847.

BU 142 (109), 16th century, fols. 72r-81v: "Iamdudum rex serenissime. . . ."

FN II. iii. 28, 16th century, fols. 26r-29r: "Incipit liber lucis mercuriorum et alphabetum divinum eximii philosophi Raymundi Lulli de compositione menstrui celestis vegetabilis atque divini lapidis phylosophorum ad serenissimum regem Eduardum argumentum et capitulum primum. Iamdudum rex serenissime de omnium corporum transmutatione locuti fuimus . . . / . . . sic est completa medicina ad laudem et honorem creatoris. Explicit liber libris (*sic*) lucis Mercuriorum."

CLM 10590, 17th century, fol. 347 *et seq.*

Magia

See *Ars magica.*

Magna medicina

Vatic. 5847, 1500 A.D., fols. 113r-122v (old numbering, 330r-339v): "In nomine domini omnium incipit libellus de magna medicina Raymundi Lulii ad regem Robertum. Proponimus namque tibi in presenti libello revelare archanum maximum et medicinam quantam durabilem et perpetuam ad vitam hominis conservandam . . . / . . . Explicit Raymundi Lulii de insula Maioricarum de magna medicina libellus ad regem Robertum scriptus per me Petrum Boccatum Iobilei A.D. 1500 currente die vero mensis Iulii quarta et quinta pontificatus Alexandri sexti."

Vatic. Ottobon. 1853 (tome ii), fols. 395r-405v, "Raymundi Lullii de insula Maioricarum in medicinis secretis libellus," is a MS of much later date with the same incipit.

BN 7150, 16th century, fols. 25r-32v: "Incipit liber medicinae magnae Raymundi Lulii Maioricani philosophi excellentissimi que omnes infirmitates sanare docet et prorogare vitam usque ad terminum a deo prefixum. Et in eius nomine incipiemus. Proemium. Proponimus namque tibi in presenti libello . . . / . . . et hec de virtutibus et proprietatibus medicine nostre dicta sufficiant. Laus deo. Finis. Ea que dixi de virtute medicine est minima pars eorum que non dixi."

In CLM 10599, according to HL No. 88, the work appears anonymously.

Mercuria

FL Gaddi reliq. 174, 15th century, fols. 99r-116v: rubric, "Liber ad faciendum mercuria et elixiris (*sic*) ex illis"; incipit, "Fili, oportet quod tu intelligas operationes per quas creatur materia argenti vivi . . . / . . . per maioris ignis decoctionem in rubedinem terminatur."

FN Palat. 792, 15th century, fols. 209v-213r: "Sequitur alia pars istius operis qui vocatur liber de mercuriis. Liber ad faciendum mercuria et elexiria ex illis. Fili, opus quod intelligas operationes per quas. . . ." *Ibid.*, fols. 213v-217v: "Liber de mercurialibus ad rubeum. Nunc dicemus cerationem mercuriorum rubeorum ad faciendum tincturam rubeam de sua propria substantia ad assequendum operationes supradictas . . ." (which shows that this is a continuation of the preceding).

FN II. iii. 27, 15th century, fols. 70v-75r: "Incipit liber mercuriorum

testamenti. Fili, oportet quod intelligas operationes per quas creantur . . . / . . . et venenatis da cum vino albo."

Vatic. 5846, 1496-1497 A.D., fols. 91v-120r: called in the table of contents at fol. 1r, "De mercuriis libellus eiusdem Raymundi." At fol. 91v, "Sequitur liber compositionis elixiris de ipsis mercuriis. Capitulum primum. Fili, opus est tibi ut intelligas opera per que creantur nostra argenta viva. . . ." The work runs to 52 chapters, including what sometimes is listed separately as the *Practica de furnis*.

Wolfenbüttel 3076, 15th century, fols. 82v-124r: "Sequitur liber compositionis mercuriorum et elixir de ipsis mercuriis. Fili, opus est tibi ut intelligas opera per que. . . ." Also in 52 chapters.

Vienna 5485, 15th century, fols. 117r-126r: Liber de mercuriis. "Fili, oportet quod intelligas . . . / . . . defundi vel servari."

BU 270 (457), XIV, 3.

BU 523, 15th century, fols. 27r-38r: "Fili, necesse est tibi. . . ."

BU 524, 15th century, fols. 56r-69r.

Berne A 78, 15th century, fols. 170r-173r: rubric, "Hic incipit liber mercuriorum"; incipit, "Care fili necesse est ut tu intelligas. . . ." This is too brief to be more than an excerpt.

Mercuria ad rubeum

See *Mercuria.*

Mercurio solo (De)

Since HL 29, 279-280 (No. 109) mentions no MS of this work and states that the edition of 1561 first ascribes it to Raymond Lull, and that no MS seems to have authorized this, the following MS may be noted. It appears, however, to have been written after 1561 and may have been copied from that edition. But the treatise occurs in it anonymously so that it may be independent corroboration of the contention of the *Histoire littéraire.*

Naples VIII. D. 17, in the first part of the MS where the leaves are unnumbered, following the *Perfectum magisterium* of Arnald of Villanova which is here called "Lumen luminum Arnaldi." "Libellus utiliss: de Mercurio solo. Est lapis unus medicina una in quo magisterium consistit. . . ."

Methodus directus

See *Ad amicum suum.*

Octo operationes

FL Gaddi reliq. 174, 15th century, fols. 10r-14v: "Octo operationes magistri Raymundi Lulli. Materia lapidis est res vilis pretii ubique reperibilis quia est aqua viscosa. . . ." But this is evidently the *Liber lucis* of John of Rupescissa shorn of its prologue. In the following MS it is ascribed to Raymond under its own title.

Vienna 5487, 15th century, fols. 105r-106v: "Accurtata libri lucis Reymundi qui incipit, Consideravi tribulationes electorum etc., compilata per Ioannem de Rupescissa." The foregoing is written partly in the margin. Then we read, "Materia lapidis est una res vilis pretii . . ." etc.

Potestas divitiarum

BN 7165, 1542 A.D., fols. 1r-22r: "Dompnus Paulus Francus de asaco sinibus de civitate Trohijne scripsit 1542, 4 novembris."

In BU 747 (1492), 15th century, fols. 76v-81r, which I have not seen, a 'Potestas divitiarum' is ascribed to Hugo Pisanus. "In compositione . . . / . . . et naturam posside."

In FL Palat. 885, 16th century, fols. 421r-423v, Potestas divitiarum, opening, "In nomine domini, Amen. Accipe lapidem nostrum benedictum . . ." is ascribed to Ortolanus.

Practica

FL Gaddi reliq. 174, 15th century, fols. 47r-65r: "Alkimia est pars occulta philosophie naturalis licet necessario . . . / . . . cetere significationes literarum habentur superius in prima distinctione alphabeti. Explicit feliciter." Again at fols. 71r-99r: rubric, "Incipit practica. Et primo ponitur diffinitio, Quid sit alkimia." Incipit, "Archimia est quedam pars occulta philosophie naturalis magis necessaria . . . / . . . rotunda intus et foris. Deo gratias." Its headings agree with the chapters as printed by Zetzner.

FN Palat. 792, 15th century, fols. 188r-209v: this text also agrees substantially with Zetzner.

FN II. iii. 27, 15th century, fols. 58r-70v: following the close of the *Theorica* of the *Testament* we read, "Incipit pars secunda magni Raymundi Lulii in qua continentur duos libros (*sic*) quorum unus basis sive fundamentum totius practice huius scientie est summa prudentia legendus, alter vero mercuriorum et sequentia huius primi fundamenti." Then at the top of fol. 59v is written: "Practica testamenti. De distinctione alchimie. Alchimia est quedam pars occulta

philosophie naturalis magis necessaria. . . ." At fol. 70v the work ends, "pars huius est rotunda intus et foris."

Vatic. 5846, 1496 A.D., fols. 73r-90v.

Wolfenbüttel 3076, 15th century, fols. 57r-82r: "Incipit practica magistri Raymundi Lulii de lapide philosophico et primo diffinitio que res est seu que scientia vel ars est Alkimia. Alkimia est quedam pars naturalis philosophie celata magis . . . / . . . et extra rotunda est."

Bordeaux 530, 15th century, parchment, 41 fols.: "Incipit secunda pars magistri Raymundi Lulii super practica predicte prime partis que est theorica. . . . Alkimia est una pars celata philosophie naturalis. . . ."

BN 14008, 15th century, fols. 45r-62r: "Practica testamenti. Alkimia est une part celer de philosophie natural mais necesse de laquelle . . . / . . . figura tibi monstrat. Et intellige quod quelibet pars illius est rotunda intus et exterius."

BU 523, 15th century, fols. 1r-26r.

See Otakar Zachar, *O alchymi a ceskych alchymistech,* Prag, 1911, pp. 40-42, for two fifteenth century MSS at the university of Leyden and in Czechoslovakia.

Practica de furnis

See *Furnis.*

Practica leonis

FN II. iii. 27, 15th century, fols. 172v-173v: "Liber practice leonis. Recipe totum dissolutum ut nosti et mitte ad distillandum . . . / . . . quod videris si ulterius proicere poterit."

Questionarium

FN II. iii. 27, 15th century, fols. 249v-258v: "Liber questionum secretorum secunde formationis. Fili, damus tibi doctrinam per questiones ad finem ut possis . . . / . . . falsitatis huic arti repugnantem."

Vatic. 5847, 1500 A.D., fols. 60r-67r (old numbering, 261r-268r): "In nomine domini, Amen. Sequitur quartus et ultimus liber quinte essentie Raymundi Lulii qui aliter intitulatur questionarium. Lege feliciter. Questio prima. Utrum deus sit causa primaria huius artis . . . / . . . Explicit liber quartus et ultimus quinte essentie qui aliter questionarium appellatur editus per egregium doctorem Raymundum Lulium de insula Maioricarum ad laudem honorem et gloriam salvatoris et domini nostri Iesu Christi et eius matris gloriose Marie semper virginis quorum nomina benedicuntur in secula et ultra, Amen." There are 29 questions in all.

FN Palat. 792, 15th century, fols. 218r-219v: a fragment giving questions 19 to 30 inclusive.

Also embodied in the *Tertia distinctio,* which see.

Questiones

See *Questionarium.*

Quid sit materia lapidis?

FN Palat. 792, 15th century, fols. 34r-57v: "Raymundi. Quid sit materia lapidis et quot requiruntur ad eius creationem. Materia siquidem nostri lapidis vel sulfuris est humor seminalis . . . / . . . ad instar nature seu circularem modum."

Quinta essentia

See *Secretis naturae.*

Repertorium

Berne A 78, 15th century, fols. 135r-141r: rubric, "Hic incipit conclusio summatim (*sic*) ad intellectum codicilli et testamenti et aliorum librorum nostrorum scilicet liber nominatus Repertorium Ray. Lulii"; incipit, "In nomine domini amen. Aqua nostra philosophica et secreta arguitur in tribus naturis. . . ." The work ends: ". . . et per tale artificium materia ingressum habebit in illo. Et in hoc absconditur practica secundum plurimos. Hic completur liber Repertorii secreti Raymundi Lulii" (then in a blacker, probably later hand) "super codicillum et testamentum qui alias dicitur intentio summaria et aliter appertorium."

Vatic. 5847, 1500 A.D., fols. 99r-101r (old numbering, 313r-315r): "Incipit conclusio summaria valde utilis ad intelligendum testamentum et codicillum et alios nostros libros necnon argentum vivum in quo pendit intentio intentiva huius artis que aliter Repertorium vocatur. Aqua vero nostra philosophica (vocatur) secreta tribus naturis componitur. . . ."

FN II. iii. 28, 16th century, fols. 13r-16r: "Incipit Repertorium valde utile ad intelligendos alios libros Raymundi Lulii doctissimi phylosophi a deo nobis concessi ad Odoardum regem Anglie. Rex, aqua nostra physica tribus naturis componitur . . . / . . . et huius rei prac-

tica latet in Testamento. Explicit Repertorium divini Raymundi Lulii ad Eduardum Anglorum regem sub sigillo secreto."

The following I have not seen:

CLM 26059, 1507-1508 A.D., octavo, fol. 1v *et seq.*, Repertorium cuius initium deest.

CLM 25115, 16th century, fol. 181 *et seq.*

BU 168 (180), 15th century, fols. 56r-60r: "Incipit conclusio summaria valde utilis ad intelligentiam testamenti, codicilli et aliorum nostrorum librorum. Aqua vero nostra. . . ."

Secreta totius astrologiae

See *Experimenta.*

Secretis naturae (De)

Under this heading I mention continental MSS where the Lullified version of Rupescissa's two books on the fifth essence are combined with the *Tertia distinctio* or are found by themselves.

BN 7164, 15th century, fols. 15r-102v: in smaller writing in the top margin of fol. 15r is found, "Incipit liber secretorum nature sive quinta essentia Raymundi Llull." The text then opens, "Contristatus erat Raymundus et non modica . . ." which is the usual incipit of the preliminary dialogue with the monk. On fol. 16v, "Deus cum tue sublimis bonitatis ac infinite potestatis virtute incipit liber secretorum nature seu quinte essentie. . . ." At fol. 55r, "Hec est tertia distinctio seu tertius liber huius voluminis." The *Tertia distinctio* closes at fol. 98v, ". . . et huic arti magnam necessitatem veritatis contra impossibilitatem veritatis felicitatis arti repugnantem." The concluding disputation with the monk follows at fols. 98v-102v: "Et finivit Raymundus librum istum Parisius anno ab incarnatione domini millesimo CCC°XIX° in monasterio sancti Benedicti Carturiensis extra civitatem. Deo gratias."

Vienna 5485, 15th century, fols. 1r-70r: "Contristatus erat Raymundus et non modica desolatione repletus . . ."; fol. 1v, "Incipit primus liber de consideratione omnium rerum transmutabilium et liber de famulatu philosophie datus evangelicis pauperibus"; fol. 2r, "Incipit liber secretorum nature quinte essentie. Deus cum tue sublimis bonitatis ac infinite potestatis"; fol. 28r, "Deus cum tua magnitudine et affluente largitate incipit tertia distinctio seu tertius liber huius voluminis . . ."; fol. 59r, "De disputatione monachi super veritate alchimie. Cumque Raymundus librum super quod rogatus fuit a monacho . . ."; fol. 61v, ". . . quod quidem librum Christi custodie commendavit. Finivit Raymundus librum istum Parisius anno ab incarnatione domini M°CCC°XIX° in monasterio sancti Benedicti Carturiensis extra civitatem. Deo gratias." Lullian tables follow to fol. 70r.

BN 7177, 15th century, paper, fols. 3r-65v: "Liber secretorum nature seu quinte essentie magistri Raymundi Lulii incipit. Deus gloriose cum tue sublimis bonitatis sapientia ac infinite virtutis potestate incipit liber secretorum nature seu quinta essentia qui dat doctrinam extractionis eius ac applicationis ad corpora humana et ad opera mirabilia. . . ." This first page is illuminated. On fol. 4r we read, "Ast liber iste dividitur in quatuor partes, in tres videlicet distinctiones vel libros," and Lullian doctrines and citations follow, but at fol. 65v the second book in 17 canons closes, ". . . Et iste sunt regule generales in curis cirurgie que tibi sufficiant causa brevitatis. Explicit deo gratias," and there is no trace of the *Tertia distinctio,* fols. 66r-72v being blank, and extracts from Albertus Magnus's *De vegetabilibus et plantis* occupying the remainder of the MS from fol. 73r to 96v. Nor does any dialogue with the monk precede the two books on the fifth essence.

BU 20, 15th century according to Frati, third item, a mutilated fragment.

BU 169 (181), 15th century. I have not seen the MS but infer from Frati's description that it includes the *Liber tertius, Questiones,* and final disputation with the monk, but not the introductory meeting with him.

BU 1353 (2591), 15th century, fols. 1-37: "Raymundi Lulli de consideratione quinte essentie. . . . Incipit liber de famulatu phylosophie . . . qui liber directus fuit a B. Raymundo yllerde de insula maioricarum abbati sancti Benedicti apud Parisius prout ipse Raymundus in prologo libri dicte artis dicit. Dixit Salamon . . . / . . . evangelicis viris erogatus, deo gratias, amen." Apparently only the first two books.

See also *Tertia distinctio.*

Tertia distinctio

Under this caption I list continental MSS where the *Tertia distinctio* is now at least found separately.

FN II. iii. 27, 15th century, fols. 236r-249v: "Dicto de medicina et magisterio quinte essentie ad humana corpora prosequi intendimus

et de eius applicatione ad artem transmutatoriam cuius in exordio libri huius tractationem premissimus, unde incipit tertia distinctio seu tertius liber huius voluminis que sic intitulatus, Deus cum tua magnitudine et affluente largitate incipit tertia distinctio seu tertius liber. . . ." Since the *Questiones* are here presented as a separate treatise at fols. 249v-258v, we do not have "De disputatione inter monachum et Raymondum" until fols. 258-260v (fol. 258v precedes fol. 258r in this MS). In this MS fols. 174r-226v are missing, and fols. 226r-236v occupied with Lullian tables, so that the first two books on the fifth essence probably originally preceded the *Tertia distinctio* in it.

Milan Ambros. D. 512 inf., 15th century, fols. 1r-33r: "Deus cum tua magnitudine et affluente largitate incipit tertia distinctio libri de secretis naturę sive quinta essentia. Dicto de medicina et magisterio quintę essentię ad humana corpora, prosequi intendimus de eius applicatione etiam ad artem transmutatoriam cuius in exordio libri huius tractationem promisimus, unde incipit Tertia distinctio huius voluminis qui sic intitulatur. Deus cum tua magnitudine (as before). . . ." "Tertia distinctio" has been corrected in these lines to "Quarta" or to "Quartus liber," but of course incorrectly. At fol. 17r, "Incipit tertia pars tertie partis libri secretorum in qua continentur Questiones artis"; at fol. 30r, "In nomine domini nostri Iesu Christi explicit liber de secretis naturę sive de quinta essentia"; at fol. 30v, "Incipit disputatio monachi contra Raymundum de possibilitate alchimie"; at fol. 33r, "Et finivit Raymundus librum istum Parisiis anno ab incarnatione millesimo trecentesimo decimo nono in monasterio sancti Benedicti Quarteriensis extra civitatem."

BN 14008, 15th century, fols. 69r-103v: "Hec est tertia distinctio huius libri qui est de cura metallorum et de illorum magisterio. . . ." The treatise ends without the disputation with the monk which commonly follows it. The order of its first half, at least, seems more like that of what is listed above under *Cura individuorum* than that of other versions of the *Tertia distinctio*.

Vienna 12834, 16th century, fols. 60r-70r: "Tractatus qui dicitur compendium roseis odoribus fulcitum ut rosae inter spinas. Deus cum tua benedictione . . ." is really the latter part of the *Tertia distinctio*, especially its *Questiones*, with the *Disputatio monachi* opening at fol. 65v. At the end the treatise is dated 1330 instead of 1319, "Finivit Raymundus librum istum Parisius anno domini 1330."

BN 7167, 16th century, first item.

BU 270 (457), V, 2.

Berne A 78, fols. 95r-134v: extracts.

See also *De secretis naturae*.

Testamentum, Theorica

See *Practica, Mercuria, Furnis,* for other parts of the *Testament*.

Vienna 5487, 15th century, fols. 47r-102r: "Raymundi Lully Prima pars testamenti" is written at the top of fol. 47r. Then, "Deus qui gloriosus et omnipotens . . ." and later the incipit of the first chapter in the printed edition, "Entia realia stantia in primordialibus . . ." but here the first chapter does not begin until fol. 49v.

FN Palat. 792, 15th century, fols. 58r-151r.

FN II. iii. 27, 15th century, fols. 1r-57r: "Deus qui gloriosus et omnipotens . . ." and later, "Entia realia stantia in primordialibus. . . ."

Vatic. 5846, 1496 A.D., fols. 13r-71v: "Finis testamenti Raimundi Lulii ad laudem et gloriam redemptoris et domini nostri Iesu Christi et eius gloriose matris Marie semper virginis quorum nomina benedicantur in secula et ultra. Et ad utilitatem scriptoris et aliorum filiorum filosophie et electorum dei scripti per me Petrum Boccatum utriusque iuris doctorem de Tybure quem cum prole pia benedicat virgo Maria, Amen. Anno domini 1496 currente die vero quarta mensis novembris sedente Alexandro VI^to^ pontifice maximo et Ursinos expugnante per suos et Italice lige armorum ductores et milites."

BN 14008, 15th century, fols. 41r-44r: "Incipit liber de transmutatione formarum et lapidis cum suis entibus realibus magistri Raymundi Lullii qui dicitur testamentum. Deus qui gloriose omnipotens existis. . . ." Only the first part of a French translation: "Les ens reals estans en les primordials. . . ."

Vienna 12834, 16th century, fols. 71r-178v: "Principia naturalia primordialia . . . / . . . cum conservatione speciei multo magis resplendentis." In 70 chapters only.

BN 7166, 16th century.

Naples VIII. D. 19, very late writing, paper, quarto: catalogued as "Super alkimiae artem codicillus, sive eiusdem Theorica," it is really the *Theorica* of the *Testament* in a hundred chapters. It probably has no independent value and is inaccurate, as "Entia moralia" instead of "Entia realia" for the opening words shows.

BU 270 (457), V, 8; XXIII, 1.

Berne A 78, 15th century, fols. 157r-169v: rubric, "Hic incipit quidam parvus tractatus ex testamento venerabilis doctoris Raymundi Lulii abstractus per Petrum de Preziau (*Preriau* in the catalogue) super veram compositionem lapidis philozophorum"; incipit, "Deus qui gloriose omnipotens existis. . . ."

APPENDIX 40

MANUSCRIPTS OF WORKS BY BLASIUS OF PARMA

First is given a brief form of title, then the number of the work in Affò's list of the *Opere* of Blasius (*Memorie degli scrittori e letterati parmigiani,* II, 1789, 119-125), then editions, if any, then MSS mentioned by Affò, and finally others not mentioned by him, which are marked by an asterisk.

Aristotle, Commentaries on

Affò, III, noted the following collection of commentaries by Blasius on several works of Aristotle.

Rome, Chigi MS (number or shelf-mark not stated), folio, paper, written in 1385 at Pavia: "Blasii de Parma excellentis artium doctoris explicationes praelectionum librorum I et II de generatione et corruptione Aristotelis; item liber meteor. ac de anima et physicorum eiusdem." This seems to be the only MS of the commentary of Blasius on the De generatione et corruptione.

De anima

*BL Canon. Misc. 393, 15th century, fols. 1-78: "In Aristotelis de anima libros tres commentarii, or, Questiones de anima Blasii de Parma. Circa librum de anima queritur primo utrum subiectum proprium sit anima vel iste terminus . . . / . . . quomodo procedant rationes que fiebant in principio questionis etc. Explicit liber iste per Dey gratiam."

*Turin 1247 (H-III-30; Pasini, lat. 435), 15th century, paper, 41 carte: Questiones in libros tres Aristotelis de anima.

De coelo et mundo (Affò, VI)

Milan, Ambros. P. 120 (Affò gives no date or pages): "Circa primum librum de coelo et mundo quaeritur primo secundum egregium doctorem et magistrum Blasium de Parma utrum omnis quantitas sit divisibilis in semper divisibilia, et arguitur quod non . . . / . . . Expliciunt quaestiones librorum de coelo et mundo egregii artium doctoris magistri Blasii de Parma, scriptae pro magistro Antonio de Abruzio."

*BL Canon. Misc. 422, 15th century, paper, double columns, folio, fols. 1-52: "Obmissis causis aliis que consueverunt inquiri in principiis aliorum librorum condescendam ad textum . . . / . . . hoc modo determinandum est de generatione et corruptione etc. Explicit Summa super libro de celo et mundo compilata per famosissimum artium doctorem magistrum Blazium de Parma de Pelacanus (*sic*) in Bolonia."

*Rome, Angelica 592 (F. 6. 4), 14th century, paper, fols. 1-34: In Arist. de coelo et mundo libros 1, 2 et 4 commentarii, "De naturali scientia fere plurima videtur circa corpora et magnitudines etc. Obmissis omnibus causis . . . / . . . modo de generatione et corruptione." The catalogue states that this corresponds to the text in BL Canon. Misc. 422. Fols. 36-73, Ex eodem Blasio et Alberto de Saxonia in eosdem libros de caelo et mundo commentarii: "Queritur primo circha primum de celo et mundo utrum omnis . . . / . . . sic finite iste questiones de celo secundum Albertum Blaxium de Parma."

*Rome, Angelica 595, early 15th century, paper, 68 fols. with two missing at the beginning: "Expliciunt questiones de celo et mundo date per magistrum Blasium de Parma reverendum et doctorem sufficientissimum."

*Vienna 2402, fols. 1-63v.

Tiraboschi, VI, i (1824), 503, note a, mentions a MS at S. Maria del Popolo, Rome.

Meteororum (Affò XI, XII)

Vatic. 2160, folio, membrane and paper: "Conclusiones super libris methaurorum Aristotelis secundum magistrum Blasium de Parma," opening, "De primis igitur quidem causis . . ."; followed by "Quaestiones in libros metheoreorum," opening, "Circa primum librum methaurorum Aristotelis primo quaeritur secundum magistrum Blasium de Parma utrum iste mundus generabilium et corruptibilium gubernetur a celo. . . ."

*FL Ashburnham 112 (185-117), 1399 A.D. (not 1389 as stated in the catalogue of the Ministero della pubblica istruzione), paper, double columns, fols. 1-60: "Queritur primo iusta principium primi libri

methaurorum Aristotelis utrum iste mundus generabilium et corruptibilium gubernetur a celo . . . / . . . Expliciunt Questiones totius libri methaurorum recollecte sub reverendo et excellenti artium doctore magistro Blaxio de Pelacanis de Parma et scripte per me Barnabutium de Faverio in Monte Silice tempore quo pestis vigebat Padue et hec annis domini currentibus MCCClxxxxviiii die xxvii septembris, Amen, Amen, Amen."

De motu

*Vatic. Barb. 357, 15th century, fols. 1-16v: Blaxii Parmensis de motu iuxta mentem Aristotelis. "In omni predicata potest esse mutatio . . . / . . . conferetur b igitur etc."

Physicorum (Affò, IV, V)

Vatic. 2159, paper: "Expositio in octo libros physicorum per questiones secundum serenissimum artium illustratorem magistrum Blaxium de Parma. Quoniam quidem intelligere et scire contigit . . . / . . .Expliciunt questiones octavi libri et ultimi physicorum secundum Blasium de Parma qui subtilium doctor appellatur die iovis xviiii mensis Iulii 1397 in studio Papiensi scripte per me Bernardum a Campanea de Verona hora tertia noctis." Affò gives no page references but states that the following commentary in the same MS is an entirely different work: "Questiones aliae in octo libros physicorum. Gratia regis celorum qui totius are (*sic*) elementalis summus est imperator in laudem et gloriam serenissimi ducis Mediolani . . . / . . . Expliciunt questiones super 1, 2, 3, 4, 5, 6, 7, et 8 libris physicorum Aristotelis disputate et in scriptis tradite in civitate Papie per perspicuum doctorem Blaxium de Parma anno domini 1397."

Vatic, 3012, paper. Affò identifies this with the first of the two commentaries in Vatic. 2159. At the close is written: "Iste questiones Blaxii super libros physicorum sunt fratris Petri de Raymundis de Cumis ord. predic. quas scribi fecit anno domini 1409 anno scilicet primo quo fuit magister stud. conv. Papiensis quas et sub ipso magistro Blaxio audivit."

Buridan

*S. Marco X, 103 (Valentinelli), about 1396 A.D., fols. 83-84: Elenchus questionum (eiusdem Buridani) ordinatarum per me Blasium de Parma.

Demonstrationes

*Vatic. 3379, fols. 31r-39v, is a spherical or astronomical geometry with figures which the catalogue lists as "Blasii Parmensis Demonstrationes," but which does not seem to be so ascribed in the MS. It opens, "Corpus sphericum est. . . ."

Affò, XIV, perhaps means to refer to the above when he lists Vatic. 3370, "Demonstrationes Blaxii Parmensis super spheram."

Duo corpora (Affò, II)

"Queritur utrum duo vel plura corpora dura possint se tangere et ab invicem equidistanter elevari . . . / . . . Explicit questio Bononie disputata per reverendissimum doctorem Blasium de Parma omnium septem artium professorem Parisius doctoratum," Venetiis, 1505, with the *Questio de modalibus Bassani Politi* etc.

*BL Canon. Misc. 177, late 14th century, fols. 155-158, "Blaxii de Pelacanis de Parma famosi doctoris Parisini. Queritur utrum duo corpora dura. . . ."

*BU 1332 (2567), 15th century, paper, fols. 57-60v: "Questio magistri Blasii de Parma utrum duo corpora dura possint se tangere."

*S. Marco VI. 155 (Valentinelli, XI, 18), early 15th century, fols. 105-112: "Utrum duo corpora dura vel plana possint se tangere et ab invicem equaliter eque distantes elevari . . . secundum magistrum Blasium de Parma qui inter philosophos ita est sicut sol inter astra."

Intensio et Remissio

*S. Marco VI. 62 (Valentinelli, XI, 20), 15th century, fols. 1r, col. 1-18r, col. 2: "Circa materiam de intensione et remissione formarum ego quero utrum possibile sit aliquam qualitatem intendi simul et remitti . . . / . . . Et sic sit dictum pro tota questione ad laudem et honorem dei omnipotentis et sue matris Marie virginis, Amen. Expliciunt ea que sufficienter sub brevitate dici possunt circa materiam de intensione et remissione formarum in hac nobilissima questione secundum excellentissimum omnium liberalium artium monarcham necnon studiorum Italie illustratorem magistrum Blasium de Pellachannis de Parma que quidem questio est mei Francisci filii eius etc. Is liber est Francisci Pellachanna ab origine nati, Amen." Fol. 18v is blank except for verses celebrating Blasius from his epitaph, reproduced by Affò, II, 116, though not from this MS.

*BL Canon. Misc. 177, closing 14th century, fols. 24-39: "Utrum evi-

dens sit aliquid . . . / . . . Explicit questio de intensione formarum disputata per venerandum doctorem magistrum Blasium de Pelacanis de Parma."

Iudicium anni 1405 (Affò, XVII)

BN 7443, 15th century, fols. 11v-17r: "Iudicium revolutionis anni 1405 11 martii cum horis et fractionibus secundum magistrum Blasium de Parma."

Latitudines formarum (Affò, I)

The work seems to have been printed three times as follows, always with other works:

"Incipiunt questiones super tractatu de latitudinibus formarum determinate per venerandum doctorem magistrum Blasium de Parma de Pelicanis (*sic*) . . . / . . . Expliciunt questiones super tractatu de latitudinibus formarum magistri Iohannis (*sic*) Horen determinate per venerandum doctorem artium magistrum Blasium de Parma de Pelacanis, impresse Padue per Matheum Cerdonis de Vuindischgratz 1482 die duodecimo Septembris. Laus Deo."

"Horem, Nicol. Tractatus de latitudinibus formarum. Pelicanis, Blas. de. Questiones super tractatu de latitudinibus formarum." Padua, Matth. Cerdonis of Windischgraetz, 1486. 20 fols.

I have not seen the two preceding editions but that of 1505, in which our treatise covers two and a half leaves, has the same titulus and colophon practically as in the 1482 edition, and opens and closes thus: "Queritur primo utrum cuiuslibet forme latitudo sit uniformis vel difformis. Et arguitur quod non . . . / . . . gradus medii totius latitudinis etc."

Affò listed no MSS of this treatise. His continuer, Pezzana, VI, iii (1827), 133, noted the first of those which follow.

Vatic. 4829, 16th century, paper, quarto: "Quaestiones super tractatu de latitudinibus formarum per venerandum doctorem magistrum de Parma de Pelacano. Primo quaeritur utrum cuiuslibet formae latitudo. . . ."

*BL Canon. Misc. 177, late 14th century, fols. 97v-100r: "Queritur primo utrum alicui forme . . . / . . . Expliciunt questiones super tractatu de latitudinibus formarum tractate per venerabilem artium doctorem magistrum Blaxium de Parma per me Donatum de Monte, artium doctorem et in medicina studentem 1392 die 29 Decembris regnante domino" etc.

*BL Canon. Misc. 181, 15th century, folio, paper, fols. 64-66: "Queritur primo utrum cuiuslibet forme . . . / . . . Expliciunt questiones utiles super tractatum de latitudinibus magistri Blaxii de Parma per me Vendrarninum scholarem artium 1404 die 19 Maii stante discordia non modica inter Venetos et dominum Paduensem."

*BL Canon. Misc. 393, early 15th century, fols. 83-87: "Quia formarum latitudines multipliciter variantur . . . / . . . Explicit tractatus philosophicalis scriptum (*sic*) per me Iohannitium de Albeto regni Neapolitani artium studentem anno domini m.cccc.ii die xxv mensis Maii." The catalogue suggests that this work may be by Blasius, but the incipit is that of the *De latitudinibus formarum* ascribed to Oresme.

Logic of Petrus Hispanus

*BL Canon. Misc. 421, 15th century, paper, double columned folio, fols. 99-222: "Incipiunt questiones magistri Blaxii de Parma super tractatus loyce magistri Petri Hyspani. Questio principalis sit hec, Utrum dialectica sit scientia. . . ." For further details see Coxe's catalogue of the Canonicus MSS.

Perspectiva (Affò, IX)

FL Plut. 29, cod. 18, 15th century, paper, quarto, double columns, 83 fols: "Queritur utrum pro visione causanda necesse est ponere species diffusas ab obiecto in oculum . . . / . . . et hec de tota questione dicta deo gratias, Amen. Expliciunt questiones perspective magistri Blaxii de Parma explete per me Bernardum Andree de Florentia die undecima mensis Martii anni 1428 ad honorem et laudem dei omnipotentis . . ."

Vatic. 2161, double columns, paper, fols. 1-40: contains only the first two parts. It opens, "Ponantur species. . . ."

Milan, Ambros. G. 71, 1445 A.D., "Explicit opus eximii viri artium et medicine doctoris magistri Blasii Parmensis super propositionibus et communibus perspectivis scriptum per me magistrum Marinum sacre theologie doctorem de Castignano ordinis minorum provincie marchie Anchonitane dum Papie studens essem discipulus magistri Francisci de Pellacanis filii supradicti auctoris anno domini 1445." Affò states that the Ambrosian library contains two other mutilated MSS.

Vatic. Barb. 357 (Barberini 732 in Affò), 15th century, wide margins, double columns, more legible than the Florentine and Vatican MSS,

fols. 61-108: "Primo queritur utrum ad visionem causandum necesse sit . . . / . . . Et sic est finis questionum scientie perspective secundum excellentissimum artium doctorem et astronomorum sue etatis principem D.M. Blaxium de Pellecanis de Parma ad laudem et gloriam gloriosissimi et eterni domini. . . ." After a table of contents comes the colophon, ". . . scriptum per me Theodoricum Goch Almanum 1469 undecima die mensis Iulii, deo gratias."

Ibid., fols. 109-122v: De perspectiva Blaxii Parmensis compendium, with the incipit, "Inter physicae considerationis studia lux . . ." which is that of the Communis perspectiva of John Peckham, and ending, ". . . lapidibus contemplemur. Et sic est finis, Amen."

Pezzana, VI, iii (1827), 133, adds to these MSS listed by Affò—but the descriptions of which I have augmented from the catalogues or MSS themselves—mention of a MS at Ferrara of 48 leaves, double columned folio, with the colophon: "Finis questionum super Perspectiva disputatarum per famosissimum doctorem magistrum Blasium de Parma quas compilavit in felici studio Papiensi anno domini 1390."

*BL Canon. Misc. 177, closing 14th century, fols. 136v-152: Blasii de Parma questiones duodecim super aliquibus proportionibus prime partis perspective. "Queritur in perspectiva utrum visio . . . / . . . Explicit questio Blaxii."

*BL Canon. Misc. 363, end of 15th century, small quarto, 194 leaves: "Queritur utrum pro visione causanda ponantur species diffuse ab obiecto in oculum . . . / . . . in tertio ad rationes contrariumque. Explicit perspectiva Blasii Parmensis doctoris famosissimi." A table of contents follows.

*S. Marco fondo antico 335 (Valentinelli, XI, 57), 1399 A.D., Super perspectiva questiones, or, Super perspectiva communi dubitationes: "Queritur utrum pro visione causanda necessarium sit ponere species ab obiecto in oculum. . . ."

*Vienna 5309, 1437 A.D., fols. 67r-126v: Blasius, Questiones in perspectivam. "Queritur utrum pro visione . . . / . . . quod faciliter potest demonstrari."

*Vienna 5447, 15th century, paper, folio, fols. 24v-131r: following the *Perspective* "Ioannis Pisani fratris minoris cognomento sed virtute facile maximi," at fols. 1r-24v, we read at the bottom of fol. 24v, "Blasii Parmensis bonarum artium ac Medicine magistri Rerum vero Mathematicarum facile principis in tres prospective huius libros questionum expositoriarum libri itidem tres Incipiunt. Liber primus. Prima Questio." The text opens at fol. 25r, col. 1: "Queri a nonnullis solet utrum ad visionem causandum ponantur species diffuse ab obiecto . . . / . . . et patet quod sit ad alias rationes dicendum. Blasii parmensis bonarum artium et Medicinę Magistri rerum vero Mathematicarum nostra ętate facile principis in Tertium prospectivę librum questionum expositoriarum ultima finit."

Ponderibus, De (Affò, VIII)

Milan, Ambros. F. 145, "Expletae sunt questiones super tractatum de ponderibus compilatae et ordinatae per magistrum Blaxium de Pellacanis de Parma artium doctorem eminentissimum."

*BN 10252, 15th century, fols. 149v-159v (of which fols. 151v-152r are left blank, apparently by inadvertence): rubric, "Incipit tractatus de ponderibus secundum magistrum Blasium de Parma;" incipit, "Scientia de ponderibus philosophie naturali vere dicitur subalternari . . ."; desinit, ". . . liquidum esse gravius ligno"; rubric, "Explicit tractatus de ponderibus secundum magistrum Blasium de Parma." Then is added, "1476 (1470?) 5 Ianuarii Neapoli per A. de Bruxella," the printer and copyist by whom other tracts in the MS are dated at various times in 1476. The work of Blasius is preceded in this MS by those of Jordanus on mirrors and weights: fols. 136r-140v, "Incipit tractatus Iordani de speculis cum commento super eodem. Visum rectum esse cuius media terminos recte continuant . . . / . . . Explicit liber de speculis"; fols. 140v-142v, "Incipiunt elementa Iordani de ponderibus. Omnis ponderosi motus esse ad medium virtutemque ipsius potentiam ad inferiora tendendi et motui contrario resistendi . . . / . . . Explicit de ponderibus. 8 kalendas novembris 1464." Passages from Isidore and elsewhere on weights and measures then fill the next few leaves.

Predestinatione, De (Affò, XVI)

Venice, Bibl. de' Santi Gioanni e Paolo 163: "Questio quedam theologica exemplata per me M. Saladinum de Roma artium et medicine doctorem que questio est de predestinatione et inveni in quodam libello theologie quem olim composuit famosus doctor artium et medicine singularissimus M. Blasius de Parma."

Predicamentis, De (Affò, X)

Affò states that it exists in Barberini 732 (now Vatic. Barb. 357) and was written on Sept. 24, 1416. See also below c under Questiones.

Proportionibus, De, of Bradwardine (Affò, VII)

Vatic. 3012, fols. 137-163v, col. 2, in the membrane portion which was purchased in 1406 by the same Fra Pietro Raimondi who in 1409 copied the commentary on the Physics of Aristotle in the paper portion of this same MS: "Queritur circa tractatum proportionum magistri Thomae Berduardini ab eximio artium doctore monarchaque domino magistro Blaxio de Parma. . . ." At fol. 163v, col. 2, we read: "Istas questiones super tractatum de proportionibus ego frater Petrus de Raymundis de Cumis emi a magistro Iacobo de Pamsalibus (Panisalibus) artium et medicine doctore anno domini 1406 die 29 Aug. et ipsas pro parte correxit magister Blaxius de Parma huius operis compilator; in residuo autem ipsas ego correxi." Thus the friar states that Blasius himself had in part corrected this copy of his work. It is in a different hand from the text of Questions on the Physics of Aristotle by James of Parma dedicated to the duke of Milan, which occupy fols. 1-110 and are written on paper. Whether this James of Parma was identical with the doctor of arts and medicine, Giacomo Panisale, who sold the work of Blasius to the friar is not stated. This Giacomo Panisale, whose name appears in various spellings in Latin in the documents, such as Iacobinus de Panisalis or Iacobus de Paninsalibus, received his degree at Pavia in logic and philosophy in 1398 and appears in the salary lists as teacher of logic from 1403 to 1408. During most of these years Blasius was his colleague: Maiocchi, I, 394-395; II, 40, 60, 68, 74, 84, 95-96, 99, 102. Fol. 136 of this MS is blank, and fols. 111-135 were missing when I examined the MS on June 22, 1927. Presumably they originally contained the commentary of Blasius on the Physics of Aristotle which the friar copied in 1409 and which Affò without giving the foliation placed in this MS in 1789.

Milan, Ambros.F.145.

*S. Marco VII. 38 (Valentinelli, XI, 14), written in 1391 A.D. by Andreas de Castello. At fols. 1-8, is Bradwardine's Proportiones velocitatum in motibus, and at fols. 8-37, "Questiones super istis proportionibus secundum magistrum Blasium artium venerabilem doctorem."

*BL Canon. Misc. 177, closing 14th century, fols. 68v-97r: "Queritur circa tractatum proportionum Pravardini . . . / . . . Expliciunt questiones magistri Blaxii super tractatu proportionum Barduardin, Amen."

Queritur utrum spericum tangat planum

*BL Canon. Misc. 177, closing 14th century, fols. 153-154: "Queritur utrum spericum tangat planum . . . / . . . et sic secundum Blaxium de Parma."

Questiones

*S. Marco X, 208 (Valentinelli), 1392 A.D. by John of Milan "ord. crucifer. in carceribus S. Marci de venetiis." a. fols. 1-25, Questiones duae supra viginti: "Questio principalis sit hec, utrum dialectica sit scientia. . . ." This is the incipit of the commentary on the logic of Petrus Hispanus which see. b. fols. 25-43, Circa capitulum de hypotheticis questiones novem: "Prima questio utrum definitio data de propositione hypothetica. . . ." c. fols. 43-82, Questiones viginti sex de predicamentis: "Sit prima questio de predicamentis utrum quando alterum. . . ." d. fols. 82-92, Questiones undecim de locis: "Circa locos sit prima questio utrum quatuor sint species argumentationis. . . ."

Sphere of Sacrobosco (Affò, XIII)

In an astronomical miscellany of the 15th century then in the possession of a Dr. Antonio Bertioli of Parma: "Incipiunt questiones super tractatum spere Iohannis de Sacro boscho per Blasium de Parma doctorem excellentissimum mathematicum singularem. Circa tractatum de sphera . . . / . . . Explete sunt questiones de spera secundum venerabilem doctorem magistrum Blasium de Parma Parisiensem."

Terminis naturalibus, De

*BL Canon. Misc. 393, 15th century, fols. 78-83: 'Natura est principium et causa motus et quietis . . . / . . . Expliciunt termini naturales in philosophia scripti per me Iohan. de Albeto regni Neapolis mccccii die Veneris xxviii mensis Aprilis." The chief reason for attributing this to Blasius seems to be that it follows his commentary on the *De anima*.

Theorica planetarum (Affò, XV)

Vatic. 4082, fol. 47 *et seq.*, "Super theoricam planetarum demonstrationes et dubia . . . / . . . Per me Petrum de Fita 1401 explete sunt theorice planetarum per magistrum Blasium de Pelacanis de Parma edite."

Vatic. 3379 (not 3370 as stated by Affò), fols. 52r-61r: Blasii Parmensis demonstrationes geometrie in theoricam planetarum, opening, "Centrum solis. . . ."

*S. Marco VIII. 69 (Valentinelli, XI, 86), 15th century, fols. 175-216, "Nuper (Super) theorica planetarum aliquas demonstrationes et dubia circa materiam. . . ."

APPENDIX 41

JACOBUS ANGELUS ON THE EVENTS OF 1382-1388: LATIN TEXT

From *Tractatus de cometis*, cap. 9.

Item anno domini M° CCC° 82 eram Parisius et tunc circa festum nativitatis beate marie virginis apparuit cometa parvus et lividus quasi in isto loco ubi apparuit cometa huius anni. Et non multum post vix per duos menses rex francie cum maximo exercitu ut dicebatur cum pluribus quam cum centum milibus equis venit in adiutorium comiti Flandrie contra gandavenses in flandria, et venerunt ad preliandum et bellandum. Et dicebatur pro vero quod de utraque parte et maxime de civibus gandavensium occisi fuerunt ultra triginta milia hominum. Rex francie rediit in regnum suum cum duce Britanie qui ista vice iuvit regem francie, et cum toto exercitu suo hostiliter parisiensem civitatem intravit. Et ibi propter seditionem quandam anno '81 inceptam per parisienses cives sedavit per maximam parisiensium civium persecutionem. Ex porta sancti Anthonii fecit rex fieri pulchrum castrum, parisienses cathenas per totam civitatem amovit, omnia arma ab eis abstulit, et sic omnes rebelles non solum parisius verum etiam in aliis civitatibus circumvicinis ad obedientiam per gravissimas penas reduxit.

Dux andenagensis patruus regis francie nunc viventis cum inauditis divitiis et maxima gente pro optinendo regnum appulie contra regem Karulum in appulium venit et bono tempore in regno illo mansit, finaliter venit postea inter gentem eius. Et evanuerunt omnes. Et mortuus est comes Subaudie et ipse dux anno domini M° CCC° 84; de mense Septembris mortuus est et multi nobiles viri ibidem peste fame et karistia perierunt et factum est de exercitu isto ac si numquam fuisset excogitatus.

Item anno domini etc. 83 circa festum sancti iacobi venit unus episcopus contra regem francie de anglia cum sex milibus lanceis ad destruendum terram regis francie, contra quem rex francie iterum maximum exercitum congregavit. Sed sine prelio cum treugis anglicorum gens in bona pace ad propria remeavit.

Item statim post scilicet anno '85 circa medium ianuarii dominus papa Urbanus sextus quinque cardinales vinculis gravissimis inclusit, postea denutria permanere girando recessit et remansit sine capite romana curia bene decem septimanis quod nesciebatur ubi in mundo papa foret et suos captus secum duxerat cardinales. Finaliter per conductum ianuensem permanere remeando ad ianuam divertebat et ibi per tempus notabile moram traxit.

Item eodem '85 de regno ungarie expellitur rex Sigismundus ita quod vix ungariorum manus evasit. Et incontinenti ungari de consensu ambarum reginarum, matris videlicet et filie marie uxoris regis Sigismundi antea expulsi, mittunt legationem solempnem ad regem Karolum de pace regem appulium ipsumque in ungariam ducunt et regni ungarii coronam cum magna regali solempnitate prout regibus congruit contulerunt. Et post duos menses vix predictus Karolus rex ungarie per suos emulos et insidiatores fuerat impie per seva sui capitis vulnera crucidatus. Postmodum rex Sigismundus in regem ungarie assumitur, magnus comes ungarie amoto capite moritur, regine ambe capiuntur, et multa in ungaria fuerant in brevi tempore per hunc cometam pertracta.

Item eodem anno '85 magne fame et potentie vir dominus Barnabas capitur et in carceribus moritur, dominus Marchio ferrariensis a popularibus expellitur et virtute Bononiensis postmodum in dominum restituitur.

Item '86 inter ferrariensem dominum et paduanum guerra oritur, ferrariensis dominus similiter victus a suis de verona fugatur, dominus Galgatz mediolanensis in domino succedit et impie verona depredatur. Postmodum dominus Paduanus per eundem dominum mediolanensem capitur et idem in carceribus mortuus est.

Item eodem anno '86, hoc est anno quarto post apparitionem comete in confinibus montium suevie in bello dux Leupoldus dux austrie etiam moritur et multi viri nobiles et strenuissimi suam cum eo vitam virili animo perdiderunt.

Et anno '88 antiqua lis et guerra inter terre dominos et imperiales suevie civitates iterum innovatur ex quo multa mala secuta fuerunt in suevia ex quibus concluditur exemplariter quod predicti eventus superius notati non solum in primo anno expectantur verum etiam plures anno (*sic*) post eius apparitionem male sue significationes po-

tuerunt evenire. Fluctuans enim mare etiam cessantibus ventis et tempestate sedata non propterea quiescit sed postmodum adhuc tempestatis periculum imminet ac si ventorum flatus in virtute sua maxima permaneret. In medicina enim legitur quia morbis amotis de humano corpore non propterea semper morborum tolluntur accidentia, que propter possibile quod annus presens fiat satis fructuosus ymo possibile est quod res bene procedant ex his sic fierent, tamen de predictis significationibus et effectibus liberti pro annis sequentibus non essemus.

Unde patet quod a tempore apparitionis huiusmodi comete successive per sex annos inclusive quod est satis breve tempus inopinabiles eventus magnarum rerum inter homines hostiliter figurant. Omnium illorum post istum cometam ego sum memor, et si in preciso deficio annorum tempore alicui, tamen factum est ita et non multum distant predicti eventus a temporibus prenotatis.

APPENDIX 42

METEOROLOGICAL PHENOMENA PRECEDING THE COMET OF 1402: LATIN TEXT

From Jacobus Angelus, *Tractatus de cometis,* cap. 7; printed at Memmingen, Bavaria, about 1490.

Istis positis nota tres in aere dispositiones quarum ego sum memor quod non est diu quod una post aliam successit per ambitum nostre terre puta in suevia. Prima fuit anno domini M° CCC° 99 aut in vigilia aut in die conversionis sancti pauli de nocte dum fierent tenebre satis post occasum solis et iam nemo sine lumine vidisset in domibus venit una universalis lux in aere et uniformis more sicut fiunt corruscationes sed diutius mansit ita quod visibilia in posterioribus partibus domorum apparuerunt. Ista lux non fuit ab aliqua stella nec a luna nec a sole nec a reflexione alicuius luminis ut manifestum est sed a flamma quadam cuiusdam uniformis exalationis per totum visibilem orisuntem spere simul ignite et flammam lucidam faciente. Secunda dispositio in aere fuit visa credo anno domini quadragentesimo circa autumpnum tunc venit per aerem una flamma longa ad longitudinem lancee habens caput quasi sicut vitulus et tendebat continue strictius usque versus caudam et venit ab occidente versus orientem satis morose transiens per aerem et in pinaculo unius domus evanuit me vidente nec habuit altitudinem unius turris et tales similes ignes in crepusculo vespertino in diversis locis eadem hora per totam sueviam apparuerunt. Tertia dispositio anno preterito scilicet quadringentesimo primo circa apprilem statim in principio venerunt tonitrua et corruscationes duraverunt per omnes menses usque ad finem augusti quod non est aliquis qui fuerit memor de tot et multis tempestatibus terre nascentia frumenta fructus et vineas destruentibus imo quasi qualibet die grandinea tempestas hic vel in convicinis dampna non modica intulit campo et agri. Iste enim dispositiones presentem cometam figurabant et multiplicatas exalationes elevari de terra continue certissime demonstrabant. . . .

APPENDIX 43

GIOVANNI DA FONTANA, METROLOGUM DE PISCE CANE ET VOLUCRE: INCIPIT, EXPLICIT, AND CHAPTER OPENINGS

BU 2705, fols. 85r-105v.

fol.

85r In nomine domini nostri Yhesu Christi Incipit tractatus de pisce cane et volucre quem doctissimus artium et medicine doctor magister Iohannes Fontana Venetus in adolescentia sua edidit. Incipit prohemium.
Solent ab artificibus et ingeniosis viris dimensiones linearum superficierum et corporum situs et differentie multifarie mensurari motus etiam et tempora metiri. . . .
Capitulum primum in quo de quibusdam principiis narratur. Agemus in hoc nostro opusculo triplici genere motus localis descensu progressu et ascensu. . . .

85v Capitulum secundum de formatione horologii inter particulas temporis et motus distinguentis.
Utile primo videtur michi preponere horologicum instrumentum motus et temporis et spatii consequenter discretivum. . . .

87r Capitulum tertium de quodam alio temporaneo et mensuratorio instrumento.
Si tamen expeditius habere voluerimus mensuratorium temporale faciliorisque compositionis et ad propositum satis validum. . . .

88r Capitulum quartum de motu descensus per aquam et aliis pertinentiis (*sic*).
Consequenter dicam de quibusdam motibus aliqualiter neccessariis. . . .

89r Capitulum quintum de quadam hominis fantasia descendendi sub aqua.

Ut vir quidam ingeniosus ex antiquis qui dudum precesserunt hanc etatem ymaginatus est sub aqua descendere et fundum eius intueri. . . .

92r Capitulum sextum de motu extensivo super planum et aliis huic intentioni pertinentibus.
Alius est motus propositus utilis et hic est de loco ad locum super planum recte procedere. . . .

95v Capitulum septimum de motu per aerem et aliis ad hoc accomodatis.
Est tertius nobis motus considerandus quo res ad altum feratur per aerem et hic similiter variis modis fieri contingit. . . .

97v Capitulum octavum de inventione proportionum et quantitatum temporum motu(u)m et spatiorum.
Volo consequenter docere qualiter cum predictis horologiis habere possimus proportionem duorum temporum vel duorum motuum vel duorum spatiorum. . . .

98r Capitulum nonum de pisce qui mensurat aquarum profunditatem.
Nunc ad mensurationem maris procedamus. Formabimus igitur piscem qui super aquas semper nataret. . . .

100r Capitulum decimum de volucre que altitudines metiri valebit.
Ad mensurandas altitudines aquilam vel pavonem vel hirundinem vel alterius speciei ex generibus volatilium. . . .

102r Capitulum XIm de cane qui longitudinem plani potest ostendere et aliis instrumentis ad hoc.
Veniamus iam ad animal quod sit planarum superficierum mensurator. . . .

103v Capitulum ultimum de modo mensurationis certiori quo predicta animalia mensurant vias suas.
Postremo nolo dimitere rem utilem mensurationibus antedictis ut de profundo plano vel alto super terram per dicta animalia vel instrumenta similia certa quantitas mensure comprehendatur. . . .

105v . . . diligunt et honorant. Nunc ultimo finem facio ad laudem dei omnipotentis, Amen.
Explicit metrologum de pisce cane et volucre quod celeberimus artium ac medicine doctor magister Iohannes Fontana Venetus cum adhuc adolescens esset edidit et notavit.

APPENDIX 44

JOHN CALDERIA, LIBER CANONUM ASTROLOGIAE: HEADINGS

From S. Marco L. VIII. 72 (Valentinelli, XI, 93), fols. 41r-129r.

Rubric: Incipit liber canonum astrologie ac totius orbis descriptione (*sic*) clarisimi viri ac fisicorum monarce Iohanis calderie veneti ad alfoncium inclitum regem aragonum

Primus liber de totius orbis generali divisione et omnium suarum partium difinitione

Capitulum primum de totius orbis generali divisione

Capitulum ii^{m} de tere difinitione ipsiusque multiplici divisione

Capitulum iii^{m} de aqua et sua multiplici divisione

Capitulum iiii^{m} de aere suarumque partium divisione

Capitulum v^{m} de igne ac generali elementorum ordine

Tractatus Secundus de supercelestis spere divisione tam essentiali quam accidentali capitulum vi

Capitulum vii de circulis minoribus et generali tere divisione in relatione ad illos circulos

Capitulum viii^{m} de totius terre divisione suisque habitabilibus et inhabitabilibus partibus

Capitulum viiii de totius terre divisione et que ad habitandum que nientiora loca sint

Capitulum x de occasu et ortu signorum

Capitulum xi de vero ordine planetarum ortu et occasu secundum astrologos

Explicit liber primus

Incipit liber secundus de celi essentiali accidentalique compositione. Capitulum primum

Capitulum secundum de essentiali accidentalique corporis lune motu atque compositione

Capitulum iii de spera solis suisque partibus essentialibus et accidentalibus

Capitulum iiii de mercurii et veneris dispositione et sibi deservientium partium compositione

Capitulum v de tribus superioribus planetis marte iove et saturno

Capitulum vi de octava spera et ceterarum sperarum dispositionibus

Capitulum vii de quibusdam planetarum dispositionibus que permutant ipsos a naturali eorum significatione

Capitulum viii in expositione terminorum et eclipsium

Capitulum viiii de modo quo siderum et planetarum loca primo inventa fuerunt

Explicit liber secundus

Incipit liber tertius introductorius ad iudicia. Capitulum primum

Capitulum secundum de essentiali ac accidentali orbis zodiaci divisione

Capitulum tertium de essentialibus signorum dispositionibus

Capitulum iiii de quibusdam accidentalibus proprietatibus signis attributis

Capitulum v de proprietatibus accidentalibus planetarum quia graduum aliqui feminini et aliqui masculini

Capitulum vi de gradibus signorum qui dicuntur lucidi vel tenebrosi (at fol. 82r, col. 2)

Capitulum vi de gradibus signorum qui dicuntur masculini vel feminini et eiusdem fortitudinis (at fol. 83v, col. 1)[1]

Capitulum vii quare dies ita diversas a planetis denominationes acceperint

Capitulum viii de significatione signorum supra nostri corporis menbra

Capitulum viiii de significatione planetarum supra menbra nostri corporis per ipsorum existentiam in diversis signis

Capitulum x de dominio planetarum quando fetus in utero vel extra uterum continetur

Tractatus secundus de divisione domorum et ipsarum significationibus. Capitulum xi

Capitulum xii de significationibus prime domus

and so on to

Capitulum de significationibus duodecime domus

Capitulum de significationibus domorum in contrariam partem eius quod primum demonstratum est

Capitulum de significationibus undecime domus

and so, in reverse order, back to

Capitulum de significationibus prime domus

Capitulum de ordine in perfectione domorum

Tractatus tertius de naturis stellarum fixarum et planetarum erraticorum. Capitulum primum

Capitulum secundum de significationibus saturni

Capitulum tertium de Iove

[1] Two successive chapters have been given the same number, six, by mistake.

Capitulum quartum de marte

Capitulum quintum de significationibus sollis

Capitulum sextum de significationibus veneris

Capitulum septimum de significationibus mercurii

Capitulum octavum de significationibus lune

Capitulum nonum de significationibus capitis et caude draconis

Capitulum decimum de numero magnarum conionctionum

Explicit liber tertius

Incipit liber quartus introductorius ad iudicia et totius astrologie generaliter scientiam continens. Capitulum primum

Capitulum secundum quid accidat planetis in semetipsis

Capitulum iii quando planete sunt septentrionales vel meridionales orientales vel occidentales

Capitulum iiii de almugea planetarum quid scilicet uni eorum accidat ab altero

Capitulum v de alintisar planetarum atque ductoria

Capitulum vi de vacuitate feralitate planete ac ipsius nature translactione

Capitulum vii de reditu luminis ipsiusque absisione. Item de prohibicione conionctionis

Capitulum viii de reditu ac refrenatione ac ipso planetarum contrarietate

The text of our MS ends with this chapter in the first column of fol. 129r, the rest of which page is left blank. The following headings for the remaining books come from a table of contents at fol. 61r, col. 2, between the first and second books.

Quintus de interrogationibus et questionibus supra quibus facere particularia iudicia valeamus

Secstus de electionibus circa omnes actiones humanas et cetera omnia contingentia

Septimus de parte forme et revolutionibus annorum

Octavus de nativitatibus et ordine principiandi cuiuscumque rei efectus contingentos

Nonus de astronomie partibus quibus gentiles utebantur scilicet nigromantia idromantia aerimatia piromantia geomantia ciromantia et ceteris alliis partibus

Decimus de particulari totius orbis descriptione particulari quid preterea in omnibus partibus scitu dignum exoriatur.

APPENDIX 45

MICHAEL SAVONAROLA, DE BALNEIS: HEADINGS

The occurrence of Savonarola's chapter headings in the Latin text may be indicated as follows, omitting words that are frequently repeated, the foliation noted being that of the 1485 edition as bound up in MS BN 7357: fol. 70v, de esse balnei; 73r, de balneo calido simplicis aque; 76r, de balneo vini simplicis; 76v, de balneo oleagineo, de balneo lacteo, de balneo aereo humido; 78r, de balneo aereo sicco; 79r, de balneo sicco igneo.

Liber secundus de naturis et proprietatibus balnearum naturalium: 80v, De proprietatibus simplicium et primo de sulfure; 81v, de alumine; 82v, de sale; 83v, de nitro; 84r, de cinere; 84v, de calce, de gipso; 85r, de ferro; 85v, de ere; 86r, Capitulum de balneis compositis, de balneis Ebani; 88r, de balneis sancti petri, domus nove, montis groti; 90r, de balneis sancti bartholomei; 90v, sancte Elene; 91r, orthoni montis, de la poreta; 92v, Romandiole; 93r, civitatis Lucane, Pisarum; 93v, Vulterre; 94r, de balneis Senarum famosis et primo de balneis petrioli; 95r, Viterbii; 96r, Esculi; 96v, urbis veteris, Perusii; 97r, montis catini, in terra laboris neapolitanis de agnano dictis; 97v, civitatis aquensis; 98r, Sicilie, de aquearo; 98v, carpensibus; fol. 100r, de balneo aque maris, de balneis artificialiter compositis; 100v, capitulum de signis pronosticis ad sciendum si balnea futuro anno salubria aut morbosa erunt et ex consequenti si ad ea transeundum sit; 102v, Dubitatio pulchra; 103r, Capitulum de observando cultu ab his qui se balneare volunt; 105v, Positis sic canonibus in generali in assumptione aque termarum observandis ponentur quidam particulares alii ad particulares egritudines pro quibus communiter homines ad balnea se transferunt; 106r, De accidentibus ex balneis evenire consuetis; 106v, Sequuntur canones balnei delaporeta; 107v, Capitulum de modo investigandi mineram et mineras balnearum naturalium.

APPENDIX 46

EDITIONS AND MANUSCRIPTS OF THE WORKS OF GUAYNERIUS

For the works of Guaynerius I have used the editions of Pavia, 1481, and Venice, 1500 (Hain 8097 and 8101), in the E. C. Streeter collection at the New York Academy of Medicine. Their colophons are as follows:

"In hoc volumine agregati sunt omnes tractatus quos clarisimus et verisimus medicine interpres Antonius Guainerius papiensis ad diversas corporis humani egritudines edidit et diligentissime emendati per prestantissimum artium et medicine doctorem magistrum lazarum datarum placentinum theoricam medicine de mane legentem in felici studio papiensi et antonii de carcano opera papie impressa anno a natali domini 1.4.lxxxi. Aureum est volumen et iuvenibus ad opus praticum noviter accedentibus maxime utile. Finis."

"Impressum venetiis mandato et expensis domini Antonii Moretti per Ioannem Hertzog. 1500. die 27 Maii."

At the British Museum (IB 31340) I have also seen the edition of Pavia, 1488 by the same printer as that of 1481, but with the name of Francis of Bobbio—"Franciscum Bobiensem"—substituted in the colophon for that of Lazarus Datarus as editor.

The editio princeps of 1481, in double columns with colored initials, has larger and more legible type than that of 1500. Both contain the same works in the same order, which is reproduced herewith, the numbers of the leaves being those of the 1500 edition, since those of the 1481 edition are unnumbered. I have not seen the other editions mentioned by Hain, such as that of Venice, 1497.

Folio	*Opera*
2	de egritudinibus capitis (16 tractates of varying numbers of chapters)
29	de pleuresi (21 chapters)
35	de passionibus stomachi (57 chapters)
51	de fluxibus (5 tractates)
62	de egritudinibus matricis (or, *mulierum*)
78	de egritudinibus iuncturarum
89	de calculosa passione
95	de peste
111	de venenis
120	de febribus
139	de balneis
141	Antidotarium

Some of his individual works had been printed separately before 1481: that on fevers by Bertoldo Rihing at Naples in 1474 (see Fava e Bresciano, II (1912), 87); the *Antidotarium* in 1472, copy in Bibliothèque Nationale, Paris.

Turning to MSS and omitting those in German libraries already described by Sudhoff, *Archiv*, XVI (1925), 117-118, I list first a number at the Vatican. Of these I have used the first two and examined the third.

Vatic. Palat. 1214, paper, 15th century, fols. 5r-70r: rubric, "Antonii Guaynerii papiensis ad s.d.d. Philippum Mariam anglum viceconitem mediolani ducem etc. papie anglerieque comitem ac ianue

dominum de peste ac venenis tractatus incipit"; incipit, "Ad te, principum et ducum illustrissime, cuius immortalitas non minus diis quam hominibus grata est . . ."; explicit, ". . . finem recipit in qua tractatus iste finitur. Laus deo. Explicit." The wording of the table of contents of the "Secunda principalis pars" on poisons—the briefer version—occupies only one page, fol. 47r, and often differs from that in the following MS and in the printed editions.

Ibid., fols. 71r-117r: "Anthonii Guaynerii papiensis de fluxibus ventris tractatus incipit"; after a table of contents, the first chapter opens on fol. 71v, "Volens de intestinorum egritudinibus doctrinam ponere . . ."; and at fol. 117r the text ends, ". . . Et in hoc ani egressionis cura finitur. Laus deo. Anthonii guaynerii papiensis de ventris fluxibus tractatus feliciter explicit. laus deo."

Vatic. 8759, 1451 A.D., fols. 1r-94v, is the second part on poisons only but in the fuller version. "Incipit secunda pars principalis huius tractatus materiam continens venenorum cuius in initio tabula ponitur capitulorum." This table of contents covers fols. 1r-4v. At fol. 94v, "Explicit secunda pars principalis huius tractatus que est de venenis et sic finitur totus tractatus tam scilicet de peste quam de veneno. Ad illustrissimum principem dominum dominum Filipum Mariam anglum Mediolani ducem et cetera Papie anglerieque comitem atque Janue dominum. Editum per Antonium de Gayneriis de Papia inter artium et medicine doctores minimum et cetera. Deo nostro iocunda sit laudatio. Millessimo quadracesimo quinquagesimo primo decimo die mensis decembris." The text is very neatly written in large letters and twenty-one short lines to a page. Fol. 95 is blank and ends the manuscript.

Vatic. 3163, 15th century, fols. 1r-80v: "Incipit tractatus de egritudinibus propriis mulierum ad magnanimum principem Philippum Marie anglum mediolani ducem et papie anglerieque comitem ac Ianue dominum. Nichil est, princeps magnanime, ut rem statim agrediar . . . / . . . dictio facta sit arbitrer. De quo crucifixo Ihesu laudes sint infinite, Amen." At fols. 3r-4v is a table of contents of the 37 chapters.

Vatic. Palat. 1194 contains the following medical works: De egritudinibus capitis, opening at fol. 1r, "In nomine Domini amen Et Dei misericordia cuius nutu sermo recipit gratiam et doctrinam perfectionem demum ordinem Rasis nono Almansoris insequendo primum a cura doloris capitis causati a materia sanguinea incipiam simplices medicinas pretermittendo . . .;" de pleuresi, addressed to Antonio Magliani, physician of the duke of Savoy, at fol. 75r, "Antonii Gnasneri papiensis ad insignem artium et medicine doctorem dominum

magistrum Antonium Magl(i)anum de Cherio illustri(s) domini ducis Zabaudie phisicum de se tractatus incipit. Tibi amoris gratia mi Antoni Magl(i)ane ad hunc deveni locum . . ."; de passionibus matricis, opening at fol. 123r, "Tractatus huius intentio est doctrinam dare curandi causas conceptionem inpedientes tam ex parte viri quam mulierum. . . ." At fol. 45 of the same MS intervenes an anonymous treatise, while at fols. 145-155v, occurs an anonymous *Consilium* on cancer of the breast, and at fols. 156-211v a series of 110 paragraphs on various diseases, without name of author or title. This MS I have not examined but am indebted for the preceding information to M. Eugène Tisserant of the Vatican Library, who further informs me that Vatic. Palat. 1195, which was not noted in my "Vatican Latin Manuscripts in the History of Science and Medicine," *Isis*, XIII (1929), 53-102, No. 41 at pp. 73-74, begins with the *De febribus* of Anthonius Gaynerius, followed by a printed copy of his *De fluxibus*. Vatic. Palat. 1221 contains *De febribus*. Vatic. 2482 is said to include *De peste;* but the MS has been examined for me by M. Tisserant and seems not to include the pest tractate.

BL Canon. Misc. 29, 15th century, small quarto, 119 fols. "De egritudinibus propriis mulierum ad magnanimum principem Philippum Marie Anglum Mediolani ducem et Papie Anglerieque comitem ac Ianue dominum"; cum pref. et elencho capitum praemissis. The preface opens, "Nichil est, princeps magnanime, ut rem statim aggrediar . . ." and the text, "Matrix est membrum a natura pro conceptione deputatum. . . ." It closes at fol. 113r, ". . . facta sit, arbitrer; de quo crucifixo Yhesu laudes sint infinite, Amen. Explicit." At fol. 115v, "An homines ex demonibus et rursum demones ex hominibus concipere possunt?" is perhaps not by Guaynerius.

BL Canon. Misc. 426, 15th century, double columned folio: fol. 124, "Incipit tractatus de venenis editus per magistrum Antonium Guaynerii artium et medicine doctorem Papiensem"; fol. 146, "Antonii Guaynerii Papiensis de artetica et calculose passionis (*sic*) ad magnificum Andream de Birago ducalem camerarium commentariolus"; fol. 187, (Eiusdem) de febribus liber, previa praefatione, "Summarium hoc de febribus in tres divisum est partes. . . ."

Vendôme 107, 15th century autograph, 153 fols. On the fly leaf we read, "Ex libris Theodori Guaynerii de Papia et amicorum," and on the reverse, "Composuit opus hoc Antonius Guaynerius de Papia, genitor meus, et maior pars huius operis est scripta manu eius propria." At fol. 1, "Summarium de febribus editum per me Antonium de Gay-

neriis in villa Chianbariaci ad insignem artium et medicine doctorem magistrum Antonium Maglianum de Cherio illustrissimi domini ducis Sabaudie phisicum. Tui amoris gratia, mi Antonii Magliane . . . / . . . per me Antonium de Gayneriis de Papia in villa Chianbariaci commorantem, 1422." At fols. 53-153, "Persepius animadvertens hoc mortale . . . / . . . in secula seculorum, Amen. etc. Explicit 2a pars principalis huius tractatus que est de venenis. Et sic finitur totus tractatus . . . per Antonium de Gayneriis de Papia inter artium et medicine doctores minimum etc."

Monast. B.M.V. ad Scotos Vindob. 273, which cannot very well be 14th century as stated in the catalogue since Guaynerius did not compose his works until the fifteenth century, contains: fols. 31r-93r, Summarium de febribus; 93v-144v, De peste; 145r-172, De venenis; 174-189, Antidotarium.

Turin 1200 (H-II-16; Pasini Lat. 533), 15th century: Antonio Guainerio, 3. De Balneis Aquensibus in Ducatu Montisferrati; 4. Tractatus de mulierum aegritudinibus; 8. De fluxibus.

The treatises mentioned in the foregoing manuscripts are all included in the printed editions, but Guaynerius is said to have also written a commentary on the ninth book of Rasis and a work on medical practice. This commentary on Rasis seems identical, however, with *De egritudinibus capitis*.

Lami (1756), p. 36, notes these Riccardian MSS at Florence: L.III.xi, Antonius Guarnerius, Practica medica; L.III.xv, Eiusdem de febribus, and Antonius magister, De abortu.

APPENDIX 47

GUAYNERIUS ON POISONS: HEADINGS

Vatic. 8759, fols. 1r-4v[1]

Incipit secunda pars principalis huius tractatus materiam continens venenorum cuius in initio tabula ponitur capitulorum

In primo capitulo ponens quid per venenum sit intelligendum aliqua incidentaliter movet dubia

Primum Numquid surdus et cecus a basilisco possit venenari

Secundum dubium numquid basiliscus prius videns hominem ipsum perimat vel econtra[2]

[1] The MS gives the number of the folio for each chapter and subsection, but these are not always quite accurate and are here omitted.

[2] At fol. 1or in the text this is more correctly worded, "Numquid homo prius videns basiliscum ipsum perimat et non perimatur vel econtra."

Tertium qualiter venenum quodcumque sit et qualitercumque aproximatum interficiat

Quartum numquid ex toto genere omne venenum principalibus cor interficiat quam aliud membrum

Quintum quod venenum ceteris paribus citius interficiat an agens intentionaliter seu spiritualiter an materialiter

Sextum an possibile sit veneni actionem ad aliqualem precisum terminum limitari sic quod ad illud tempus venenatus merito talis venenositatis moriatur et non ante nec ultra

Secundum capitulum modum edocet per quem quis se sciet ab assumptione veneni seu ab eius lesione custodire

Tertium capitulum res continet veneni maliciam frangentes ac ipsius impresionem prohibentes

Quartum querit numquid benefitio medici vel alio quis possit taliter disponi ut nullius exibiti veneni sive ab intus sive ab extra timeat actionem

Quintum modum instruit per quem quis sciet complesionem suam facere triachalem seu bezehardicam sic quod nullius veneni qualitercumque aproximati timebit actionem

Sextum novum modum triacham magnam ac mitridatum docet conficiendi

Confice sic triacham

Trocisci de viperis sic fiunt

Trocisci squillitici sic fiant

Trociscos andracaron sic conficias

Mitridatum sic confice

Trocisci cokion[3] sic fiunt

Septimum capitulum omnium venenorum quomodocumque vel qualitercumque aproximatorum curam ponit generalem

Signa igitur veneni calidi

Signa autem veneni frigidi

Signa veneni a tota substantia seu a forma specifica solum agentis

Venenatorum signa ex animalium venenosorum punctura vel morsura seu ex re aliqua venenata plagam aliquam faciente

Pronostica

Cura

De cura puncture seu vulneris venenosi

Octavum particularem curam ponit mineralium venenorum

[3] *Kokion* in the edition of 1481.

De lapide simili coralo
De argento vivo
De argento extincto et uzifur azuro et arsenico etc.
De litargiro
De cerusa
De gipso
De scoria ferri
De scoria eris
De ere viridi et spetiebus atramenti
De arsenico sublimato et non sublimato
De calce
De realgar
De plumbo husto
De magnete
De lapide lazuli non abluto
Nonum curam ponit venenorum vegetabilium
De cornu spice
De titimalo et omnibus lacticiniis venenosis et precipue de scamonea et mezereon
De kerva seu eius succo
De apio risu
De oleandro
De succo cucumeris asinini
De brionia seu eius succo
De eleboro
De ciclamine seu eius succo
De cicuta vel eius succo
De strangulatore adib leopardi et similibus
De succo coriandri
De pomis mandragore
De papavere nigro
De opio
De fungis
De iusquiamo
De nuce avelana seu alio fructu raucido
De nuce vomica
De ficu faraonis
De coloquintida
De semine urtice
De semine serpentarie

De euforbio
Decimum capitulum curam ponit venenorum animalium et quarumdam partium ipsorum
De cantaridibus
De cerebro gati
De felle leopardi
De felle canis marini
De extremitate caude cervine
De sanguine humano
De sanguine tauri
De sanguine buffonis
De sanguine menstruo
De castoreo malo
De piscibus frigidis et de carne corrupta
De cohopertis assaturis
Undecimum curam ponit generalem puncture seu morsure animalium venenosorum ac vulnerum factorum cum cutelo sagita tello vel alia re veneno infecta
Ultimum capitulum curam ponit morsure canis seu alterius animalis rabidi
Pronostica signa
Cognoscitur autem canis rabidus
Pulvis sic fit
Emplastrum sic fit
Explicit
Explicit tabula seconde partis principalis huius tractatus de peste et de venenis etc.

APPENDIX 48

GEORGIO ANSELMI, THEOREMATA RADICALIA: HEADINGS

From MS Vatic. 4080.

fol.	*Cap.*	
41r	1	Matheseos de rebus pertractat admirabilibus
41v	2	Libertas intellectus memoria existimatio stellarum matura et forme et partes et huius reliqua
42r	3	Indeficientes et eterni sunt supercelestium corporum motus
	4	Impressiones orbis non recipiuntur nisi sibi preparatis
	5	Superiora confortant inferiora et inferiora superiora

42v 6 Stellarum natura et complexio et proprietas comparantur ad elementa et secundum hoc movent
7 Demon (demum in MS) sequitur motum orbis et movet secundum appetitum
8 Ymagines et fascinamenta et haustus
43r 9 Sol astrorum rex et tocius mundane machine gubernator superiora perficit et inferiora
43v 10 Luna stellarum omnium infima quod a superioribus accipit influit super inferiora
11 Benigna stella temperata existit et amica nature maligna distemperata et inimica
44r 12 Adaugetur bonitas cum benigna fortunatur et malitia cum infortunatur maligna
13 Non est par benigne et maligne felicitas et infelicitas. Hec enim grata et quieta et honesta illa difficilis et involuta et infamis
44v 14 Nature vis est permanens signum autem et locus et orientalitas et hayz et huius reliqua et foritz opposita fortunant et infortunant et augent et diminuunt
45r 15 Solis sunt regna et potentatus et honores ores (oriens?) et pars horoscopa mundi et magna signiferi orbis medietas
16 Lune sunt humiditates et motus accessus et recessus marium et ventorum et partes celi et mundi soli adverse
45v 17 Saturni sunt ypocrisis et tristitia et invidia et frigiditas et siccitas et oriens
18 Iovis sunt veritas et honestas et spes fit quo in substantia vis eius quam lacte patens et calliditas et humiditas et pars Borealis
46r 19 Martis quidem sunt ira inimicitia et separatio et calor et siccitas et pars occasus
20 Veneris vero iocunditas et amicitia et humiditas et auster
46v 21 Mercurius hermofroditus (*sic*)
22 Stellarum primarum vis ineffabilis existit et amplius que signiferum exornant
47r 23 Planetarum vise et in parte boreali
47v 24 Arietis est signum nobilius et fortius antecedens reliqua consotia signa
48r 25 Inter stellas et signa mirabiles existunt proportiones ex natura
48v 26 Et inter signum et signum

27 Spere celestis divisio accidentalis est quemadmodum naturalis
49r 28 Et stellarum situs in accidentali circulo aducit in rebus motus diversos et admirabiles
29 Varietas motus in materia huius mundi sequitur formarum varietatem in figuris circuli superioris
49v 30 Ortus horoscopi loca cetera precedit auctoritate
31 Hora accessus solis ad arietem horarum anni dignissima
50r 32 Iuditia sua danda sunt tempori et loco et etati et sexui et condictioni et huiusmodi reliquis
33 Stellarum adinvicem adiunctio quemadmodum et natura ex amicitia et inimicitia
50v 34 Stelle movent supra partes mundi ex natura et ex accidenti
51r 35 Sicut commiscentur adinvicem stelle sic commiscent in mundo hoc res nature sue secundum posse suum
36 Fortiores sunt commixtiones dyametre et superant corporales
51v 37 Commixtio utilis est ex amicitia et bonarum amplius damnosa vero ex inimicitia et deterior malarum
38 Planete habent comparationem ad lumina in opere suo
39 Lune dispositio in radicibus omnibus est grandi animadvertenda consideratione
52r 40 Bonarum inimica commixtio parum nocet et mallarum amica parum iuvat
52v 41 Benigne absque testimonio pauca est utilitas maligne vero gravitas et impedimentum
42 Presentia dominatricis loco salus est
43 Optandum est in omni radice benignam felicem in horoscopo collocari

On fol. 53r the text ends, ". . . constiterit, vitam pariter et corpus et animam dum radicis eius sive natalicii vel cuiusvis alterius inicii custodit et . . .," and so seems incomplete.

APPENDIX 49

MANUSCRIPTS OF NICHOLAS OF HUNGARY, LIBER ANAGLYPHARUM

MS royale 5874, chart., fols. 306-329. This MS would seem to be no longer found in the Bibliothèque Nationale. The present Latin MS BN 5874 is devoted solely to historians and comprises only 160 fols. The old catalogue of royal manuscripts (*Catalogus codicum manu-*

scriptorum Bibliothecae Regiae, Paris, 1744) refers in its index under the name Nicolaus de Dacia only to MSS 7292 and 7336. Moreover, in Montfaucon's *Bibliotheca Bibliothecarum Manuscriptorum,* Paris, 1739, 5874 is one of the numbers omitted in the account of the Bibliothèque du Roi. It would seem therefore that the manuscript used by Quetif and Echard had soon after disappeared. The wording of the titulus, as given by Quetif and Echard, is: "Incipit prologus in primum librum Anaglypharum editus per magistrum Nicolaum de Dacia in theologia magistrum, et factum fuit (opus) in villa Mariologii in conventu Predicatorum cuius erat frater de natione Ungrie anno Domini nostri Ihesu Christi 1456: quod opus est magna(magne?) resolutionis in astronomia."

Colbert 1912, now BN 7336. At fols. 1-17 is found the incomplete text of the second book, reaching only through the second *Summa* on conjunctions. It gives only twelve chapters to the first *Summa* instead of seventeen as stated in Quetif and Echard. At fols. 327r-336r occurs a portion of the third book from chapter 1 to 8. Fols. 337-357 are devoted to astrological elections.

In another manuscript, BN 7292, likewise of the fifteenth century, fols. 333v-345v, are several chapters, from 8 to 13 inclusive, which are headed "Liber anagliffarum astronomie." This caption, in huge Gothic letters, occupies the entire first page. But the old royal library catalogue of MSS treats the following chapters as a separate commentary on Ptolemy by some other person. The chapter headings are somewhat as follows:

fol. 334r—Capitulum 8me prime partis almagesti pthol.
fol. 335v—Capitulum nonum de divisione eorum que servuntur scientiam lunationum in specificatione eorum secunde dictionis sive partis almagesti
fol. 336v—Capitulum x 2e dictionis almagesti de scientia angullorum provenientium ex linea orbis signorum in linea meridiei
fol. 339r—Capitulum xix (*sic*) de cognitione equandi diversitatem aspectuum in equationes rase (?)
fol. 340v—Capitulum xi de fluentia angulorum pervenientium ex cursu orizontis orbis declinationis (?) cum orbe 2e dictionis
fol. 341v—Cap. 12 de scientia angulorum provenientium per orbem signorum in orbem descriptum (?) super polos orizontis
fol. 344v—Cap. 13 de proportione tabularum horum artuum angulorum

Quetif and Echard further cited Tomasini, *Bibl. Venet.,* concerning a MS of the *Liber Anaglypharum* then among the codices of an Alexander Zilioli.

Sloane 1680, fols. 48r, col. 1-130r, col. 2. "Explicit tertius liber anaglipharum a fratre nicolao de dacia in sacra pagina magistro ordinis fratrum predicatorum compositus. Et scriptus per me petrum Smeydenitz de flesia dyocesis Wormatis (?) anno domini millesimo quadragintesimo septuagesimo sexto mensis septembris die tredecima nunc (?) hora duodecima meridiei." In her paper upon plague tractates, *Proceedings of the Royal Academy,* IX (1916), Section of the History of Medicine, 159-212, Mrs. D. W. Singer has based a brief notice of Nicholas of Dacia on this manuscript. I do not know why she gives the title of our treatise as "Anaglyphorum Florentis," unless it be that the prologue opens, "Florentis quondam vetustatis. . . ." In Scott's *Index to the Sloane Manuscripts* the title is given as "Anagliphae astronomicae."

Univ. of Cracow 545 (DD. iii. 27), paper, 15th century, fols. 157-180, "II liber Anaglipharum"; fols. 189-193, "Incipit III liber Anaglipharum"; fols. 320-383, "Summa VI de magisteriis interrogationum continentis (*sic*) IX capitula . . . / . . . Explicit IV liber Anaglipharum."

Univ. of Cracow 1850 (BB. xxiv. 8), paper, 15th-16th century, fol. 51, "Incipit liber III Anaglipharum"; fol. 225, "Et sic est finis II libri Anaglipharum magistri Nicolai etc. de Dacia"; fol. 243, "Explicit IV liber Anaglipharum."

CLM 221, fols. 229r-240v, double columns, rubric in large letters across the page, "Summa quinta libri anaglipharum de nativitatibus eximii doctoris magistri nicolai fratris ordinis predicatorum de dacia."

APPENDIX 50

MANUSCRIPTS OF WORKS OF NICCOLÒ DE COMITIBUS

On weather prediction and other general astrological judgments:

BL Laud. Misc. 535, Italian hand, fols. 1-67. Rubric, "Nicolaus de comitibus Padue et comes et eques filio suo Marmarie salutem plurimam dicit." The introductory epistle opens: "Cum te ab ineunte etate, fili carissime, in nobili astronomie scientia. . . ." The preface opens: "Astrorum sapientes de pluviis necnon de ceteris similibus aeris alterationibus. . . ." The first heading of the text is: "De coniunctione duorum ponderosorum in triplicitate ignea," and the text itself begins: "Si vero dicta coniunctio dictorum. . . ."

S. Marco VIII, 78 (Valentinelli, XI, 70), fols. 1r-96v, Nicolaus de comitibus paduae comes et aeques filio suo Naymerio salutem plurimam dicit. "Cum te ab ineunte aetate, file carissime, in nobili astronomie scientia exercueris . . . / . . . melior est novissimus sermo quam primus. Et sic sit finis huius opusculi ad laudem omnipotentis Dei eiusque Genetricis, Amen." Transcriptus Patavii anno Domini M.D.xliiii. At fol. 2r the Praefatio begins as in the other manuscript, but the text opens at fol. 2v, "Dico itaque quod signa coeli sunt duodecim . . ." before the heading, "De coniunctione duorum ponderosorum in triplicitate ignea," which does not occur until fol. 4v.

On the triple movement of the eighth sphere:

Vatic. 3379, 15th century, folio, paper, fols. 1r-4r, Breve opus Nicolai Comitis Patavini ad domin(ic)um Malatestam de triplici motu octave sphere, opening, "Tres esse speras supra speras. . . ." The same MS contains works by Blasius of Parma and Laurentius Bonincontri Miniatensis.

FL Ashburnham 134 (208-140), 15th century, carte 407-417, in a different hand from most of the contents: Nicolai de Comitibus Tractatus de motu octave spere. It is preceded at carte 407-408 by a letter which opens, "Animadvertenti mihi, domini mi collendissime . . ." and is dated, "Ex opido Montisp, 9 novembris 1450." The text of the treatise proper begins: "Tres esse speras supra speras . . ." and closes, ". . . ne nimium prolixus fiam, finem dicendi imponam. Explicit tractatus de accessu et recessu motus 8e spere per dominum Nicolaum comitem de Comitibus confectus, directus magnifico domino domino Malateste de Malatestis." The preliminary letter is not given in Vatic. 3379.

APPENDIX 51

NICCOLÒ DE COMITIBUS ON WEATHER PREDICTION: HEADINGS

The headings are followed by the numbers of the leaves where they begin, first for MS Laud. Misc. 535 and then for S. Marco lat. VIII, 78

1. de aeris dispositione sub modo et forma generali sub quo particularia in temporibus originem sortientur, fol. 13v, fol. 19v-

2. de aeris impressione ex parte pluviarum ventorum fulgurum, necnon de tonitruis et his similibus in anno contingentibus, fol. 14v, fol. 20v-

3. de cognitione imbrium sive pluviarum aliorumque similium superius dictorum per singulos menses, fol. 22r, fol. 30v-

The headings for chapters 4 to 6 are worded so differently in the two MSS that it will be advisable to give them separately. In Laud. Misc. 535,

4. de quotidianis pluviis necnon de aliis inpressionibus simili modo contingentibus, fol. 23v

5. de hora pluviarum ventorum caloris ac etiam frigoris et ceterorum similium observatio, fol. 26v

6. de cognitione ymbrium predictarumque alterationum aeris per applicationem planetarum et potissime lune ad cetera loca zodiaci octave spere que mansiones lune aput iudeos nuncupantur, et de iudicio ventorum cum aliquibus notabilibus in fine, fol. 28

In S. Marco VIII, 78

4. de his quae in die contingere visa sunt, fol. 33r-

5. de similibus supradictis occurentibus in hora, fol. 37r-

6. mansiones lunae verificatae ad tempus presens in hac arte, etiam observandae a quibus pluviae imbres venti ac aliae aeris impressiones causari ac produci aptae sunt, fol. 40r-

Capitulum septimum omnibus commune et maxime pro imperitis in arte astrorum, sed si erunt familiares philosophie, magis delectabuntur in hoc quia in ipso tractatur ad cognoscendum alterationes aeris per cometas et per signa apparentia circa luminaria et alias stellas et aliqua prodigia in aere apparentia ac per actus quorundam animalium que sentiunt ea a natura: fol. 37r, fol. 51v-

8. et ultimum de terremotibus diluviis peste caristia et guerris futuris ad cognoscendum predicta per cometas per signa apparentia in aere et colores circa luminaria, fol. 51v, fol. 73v-

APPENDIX 52

NIKOLAUS JAUER, DE SUPERSTITIONIBUS: HEADINGS

From BM Harleian 3767, fols. 89v-91r.

Incipit Registrum super libro de Supersticionibus ab eximio magistro Nicolao magni de Gawir sacre theologie professori Anno a natiuitate saluatoris Millesimo quadringentesimo quintodecimo edito secundum ordinem alphabeti.

Utrum[1] dyabolus possit inmittere in animam hominis bonum vel malum

Dyabolus non habet potestatem super animam hominis

[1] *Verum* in the MS.

dyabolus potest sensum hominis exteriorem immutare et illudere
dyabolus potest humorem oculi permutare et facere aliam apparenciam conseruatis speciebus rerum
Dyabolus ex parte medii potest illudere sensum hominis
Dyabolus potest illudere sensum hominis ex parte obiecti
Demon per absconsionem obiecti potest visibile reddere inuisibile
Demon non potest inmediate mouere racionem seu intellectum hominis nec in ipsum agere siue inmittere
Demon non potest in mediate per suam essenciam esse in anima rationali
Demon non est in anima secundum substantiam sed in corpore
demon nichil potest cognoscere nisi coniecturatim et per signa
demon non potest videre animam
dyabolus non potest hominem iuuare quin deus permittit
Boni angeli et mali angeli possunt cogitaciones bonas vel malas immittere
demon non potest facere aliquid quo facto cogitemus mala
demon non potest aliquid inprimere in voluntatem hominis
demon non[2] potest inmittere in fanthasiam angelus bonus (in) intellectum deus autem in uoluntatem
Demones non possunt scire futura tribus modis
Futura dupliciter cognosci possunt
Cause futurorum se habent tripliciter
Demones et alii spiritus creati omnia cognoscunt que sunt sub illo aere
Demones et eciam homines non possunt habere omnimodam scientiam de futuris
Multa bona de futuris quantum ad homines et demones secundum diversas rationes
dyabolus accipit plerumque potestatem et morbos immittere et ipsum aerem viciando
Demon non potest apparere in specie christi ut legitur de quodam sancto patre et ulterius bona dicta
Periculosum est hominem inexpertum in dyaboli temptacionibus solitariam vitam eligere
Modo grossi rustici eligunt heremum
Aliqui benedicunt animalia turpis lucri gratia
Potestas demonis maior est potestate cuiuscumque creature corporalis (fol. 90r)

[2] This word evidently should be omitted.

Aliqui mali angeli sunt aliquibus bonis angelis et omnibus hominibus potenciores
Nulla potest nisi creatoris altissimi vel eius admissio cognoscere demonem
Proceditur contra nigromanticos probando quod non virtute artis magyce possint cogere demonem
demones per multos coacti mira fecerunt
Racio prima quare demones fingunt se cogi
Proceditur contra incantatores et incantatrices
De stigmatis figuris caracteribus
De observancia sompniorum et augariorum (*sic*)
Quomodo demones alliciuntur per varia genera lapidum
Duplex est consideracio potencie demonum
An in corporibus assumptis habeat opera vite exercere
Demones faciunt se incubos respectu mulierum et succubos respectu virorum et multa de generatione eorum
De pueris qui interdum supponuntur
Demon potest apparere in specie vetule et rapere pueros
Demon interdum permittitur ut occidat pueros in penam parentum qui eos in tantum diligunt
Proceditur contra has incantatrices ac phitonissas que dicunt se de nocte super certas bestias equitare et multa hiis similia
Quomodo demones interdum homines et alias res inficiunt et curant
Quare deus permittit fieri hereses
Proceditur contra hos dicentes quid michi quis me adiuvet sufficit quod sim adiutus
Utrum homines licite possint uti consilio auxilio sive ministerio demonum
Refertur quantum dominus deus habeat displicenciam de huiusmodi sortilegiis
De maleficiis ad habendum prolem vel amorem ad viros vel econtra sine cordiali dilectione
Probatur quomodo nemo diem exitus ab hospicio vel introitus
Quomodo dyabolus interdum vera et bona suadet tamen tandem intendat decipere suos credentes
Quomodo tales multipliciter peccant s. peccato infidelitatis
Quomodo qui suscipit obsequium a demone committit se discrimini (?)
Quomodo tales malifici (*sic*) incantatores pro suis experimentis recipiunt pueros virgines

Instancie pulchre quomodo quidam sancti cogebant demonem ad dicendum occulta et alia cum eorum solucionibus sicut tunc arguunt tales malifici pro eorum defensione volentes nigromanciam servare contra deum

(fol. 90v)

Diffinicio miraculi et quomodo dyabolus facit quandoque miraculum falsum deus autem verum

Quomodo divinare cum caracteribus sit magnum peccatum et quomodo deus per talia offendatur

Quomodo quidam colentes huiusmodi dyabolica carmina enormiter incurrunt paganorum errorem

Quomodo fundentes demoni orationes vel oblaciones quascumque pro instinctu dicendorum futurorum peccant ineffabiliter

Proceditur contra quosdam qui solent curare infirmitates quas prudencia medicinalis contempnit suis cum certis precantacionibus et ligaturis insolitis nostri nature remordentes

Dicitur quid sit supersticio

Quomodo cultus diurnus vero deo debeat exhiberi et in quibus non liceat

Quomodo nichil preter institucionem dei et ecclesie sit addendum vel descindendum ad divinum cultum

Quid dicatur superfluum in cultu divino

Capitulum quod non licet in divino cultu addere propria auctoritate nec ympnos nec sequencias (?)

Quomodo cultus divinus exhibeatur cui non est exhibendus et vocatur ydolatrium

Ad quid sit ordinatus cultus divinus

De pronunciantibus futura per aliqua signa que apparent in rebus animatis scilicet in ungue puerili

Dicetur de sompnio et de causis eius et quomodo interpretari sit quandoque licitum quandoque vero illicitum et multa delectabilia

Quomodo divinacio que fit per astra sit licita et quomodo prohibita per racionem operari sine necessitate compulsus

Quomodo quidam dicunt quosdam fore naturales fures et lusores credentes tales actus de necessitate produci

Quomodo divinacio augurii sit illicita

Quot modis capiatur et quando sit licita fores

Quomodo experimenta sive iudicia ferri candentis sive aque ferventis sint prohibita

Quomodo monomachia sive duellum sit licitum et aliquando prohibitum

Ad hoc quod sors sit licita quatuor requiruntur

Quomodo nemo debet uti exorcismis

Quomodo nemo debet querere sortem pro dampno illicito

Ars notaria (*sic*) est inefficax

Ecce quomodo hii errant qui cum rebus naturalibus vel ad se ipsas exhibent res sacratas pro sanitatibus acquirendis ut dicit beatus (fol. 91r) Augustinus quod sacerdotes admoneant fideliter subditas magicas artes nichil posse prodesse

Quomodo abusiones et illusiones observate a pluribus sint inconsuete

Contra susurrantes equis occulte

Quomodo verba sacra singillatim sumpta esse debent

Quomodo verba non dicuntur sancta vel sacra nisi propter significationem sacrarum sic dicuntur

Quomodo tenendum sit de verbis exorcismis

Quomodo dyabolus sepe huiusmodi maleficiis se ostendat

Quid designet quod non debent certe persone adesse in extractione telorum

An licet aliqua scripta circa se portare

Quomodo herbe colligende sunt sine carminibus

Patet error dicencium quod per certas missas puta sex vel triginta possunt liberare certas animas a purgatorio si per mille annos deberent puniri

Quomodo quidam beato Gregorio ascribunt quomodo in qualibet missa redimatur aliqua anima

Utrum observande sunt dies egipciace

Utrum dies aut hore duelli sint observandi

Quomodo mali christiani observant certos dies

Item iterum contra servantes dies egipciaces

Item multi christiani dicunt diem innocentium esse infaustum id est infortunatum

Quomodo tenendum sit quod tempus in sui natura est bonum

Quomodo tales observantes peccent

Quomodo quidam surgentes de lecto suo observant motum

Quomodo tales motus non possunt esse cause effectuum talium

Consequenter de inuentu acus vel alterius parue rei

Argumenta pro confirmatione supersticionis

De annulo fabricato ex tribus clavis simul confabricatis ac simul inventis

Quomodo supersticiosi possunt egris prebere medelam sanis egritudinem
Quomodo eisdem non debeat adhibi fides
De pena supersticionum secundum canones
Quomodo clericis sit pena iniungenda
De fuga huiusmodi contra supersticiones

Prohemium in tractatum de supersticionibus

APPENDIX 53

RAPHAEL DE PORNASIO, DE ARTE MAGICA: HEADINGS

From Bologna University Library MS 969, fol. 35r, with additions in brackets from Vienna 3155.

Rubrica libri de arte magica Magistri Raphaelis de pronasio Ianuensis ordinis predicatorum
Incipit prohemium
Capitulum in quo asignatur nominis significatio primum
de artis magice antiquitate [et primo inventore] 2m
de origine et causa effectiva artis magica 3m
de ratione per quam demones esse etiam via naturali probatur 4m
quod demones etiam quandoque se sensibus perceptibiles reddunt 5m
de demonum potestate circha motum localem [corporalium rerum] 6m
confirmatio ponitur per exempla 7m
quod etiam corpora inanimata demones localiter moveant 8m
continens declarationem premissorum 9m
ostenditur quomodo unum corpus possit esse in duobos locis 10m
de transformatione corporum vel hominum in aliam speciem et figuram 11m
quid de predictis sentiant scriptores catholici 12m
confirmatio predictorum per exempla de [ex] scripturis catholicorum 13m
quod arte magica quis invisibilis fiat et clausa loca ingredi possit 14m
de modo potestatis(?) magorum et quod quandoque solis verbis inferant hominibus nocumentum 15m
de variis instrumentis artis magice et de radice virtutis eorum 16m
de effectibus artium magicarum 17m

quomodo demones in corporibus assumptis exerceant opera vite 18m
de potestate demonum et magorum contra innocentes et sanctos viros 19m
de quibusdam apparitionibus multorum modo equestrium modo pedestrium [hominum ignotorum] 20m

APPENDIX 54

FRANCISCUS FLORENTINUS ON PETER OF ABANO AND CECCO D'ASCOLI: LATIN TEXT

A. PETER OF ABANO ON GREAT CONJUNCTIONS AND RELIGIOUS CHANGE

(CLM 23593, fols. 3v-4v) "Nam ut perpulchre suos discipulos perdocuit, a mundi exordio cum fluxissent anni ferme mille quadringenti, coniunctio maxima duorum planetarum qui ceteris super sunt Saturni et Iovis in primo Arietis termino facta est, in qua cum Saturnus sibi dominium vendicasset mores hominum silvestres horridi incompositique fuerunt terrarumque cultus tunc maxime exercebantur nec propterea suaves cibos nec ornata indumenta tunc temporis homines queritabant, et ex ipsius etiam planete dominio post ipsorumque planetarum conventum maximo aquarum diluvio terra ut prefertur absorta est.

Inde vero post annos mille duo illi planete altiores in initio Arietis convenerunt et Iuppiter cum participatione Saturni sibi dominium vendicavit. Hinc quidem leges cepisse et iudaicam primo inde homines graves modesti moribusque optime compositi fuerunt.

Demum cum in eodem loco convenisset Mars qui tertius planeta est et dominaretur, tunc ardor bellorum cepit tum arma exerceri.

Deinde convenerunt Solque dominium suscepit coniunctionis, tuncque lex egiptiaca surrexit que cum esset ydolatrie mater et origo militiam celi et stellarum precepit adorari cuius princeps est Sol. Tuncque homines honoris studio plus ceteris temporibus vigilarunt.

Postea vero ut arbitror transactis annis sexcentis ante Virginis partum coniuncti sunt Mercurio qui scientiam influit, quare sicut Solis fuerat liberalitatem magnificentiam gubernandique influere disciplinam et homines intentissimos reddere, ita et Mercurii fuit scientiam vite quoque asperitatem unde lex nostra surrexit ceterarum disciplina homines non plus tunc se scientiarum studiis tradiderunt. Etenim eo tempore philosophi illi summi Socrates Plato Aristoteles claruerant et poete quamplures in hoc annorum millenario sub Mercurii potestate homines multum in scientia profuerunt.

Postremum vero iam post annos octingentos coniuncti sunt Venus ille voluptuosissimus planeta qui sibi in coniunctione ducatum assumpsit, et hinc Macumetti secta prevaluit voluptates tunc amplectendas unusquisque putavit ornatissimisque indumentis et omni luxurie propterea sunt homines dediti.

Tandem expectanda futura est ultima coniunctio que Lune ascribenda fertur post annos non ultra centum et sexaginta a novissima ipsa coniunctione, cuius temporibus nisi infallibilis a dominoque observatus ordo pretermittatur insurget Antichristi lex.

Quare ex hiis que ita meminimus non modo minimarum rerum et mediocrium naturas verum etiam totius mundi leges status moresque hominum a celestibus corporibus regi mutari et firmari nemo sane mentis negabit. Hinc igitur huius temporis homines procliviores et proniores reddi videmus ad singula mala opera, deficientes in fide, frigidissimi in celestibus, in terrenis autem rebus vilibus et exiguis ferventissimi. Quamobrem astrologorum peritia magnipendenda est que nobis inextimabilia bona divinaque confert beneficia."

B. CECCO'S HERESY

(CLM 23593, fol. 12r-v) "In parem Franciscus eschulanus etiam errorem prolapsus est ob quem ab Inquisitore heretice pravitatis florentino tali de heresi convictus merito crematus est. Asseveraverat quidem prave legens suis in scolis et docuerat tractatumque ediderat quod dei filius christus yhesus humani generis redemptor sub constellatione stelle ab oriente magos reges perducentis natus fuerat sive conceptus ac necessario ipsius stelle influxu pauperem vitam duxit in presepio quidem iacuit bovi et asino sociatus. Quid plus(?) certe eadem pertinaci temeritate addidit quod adversa ac molesta cuncta que perpessus est adusque mortem inclusive eadem necessitate sustinuit sicut prefati reges ex eodem influxu sideris yerosolimam venerunt regem querentes iudeorum christum nuperime natum eis per ipsum sidus demonstratum cum astrorum arte pollerent quemadmodum Leo papa testis est. Quid itaque profanius aut execrabilius hereticus iste proferre valuisset aut confingere potuisset quam dicere conditorem omnium ita ex influxu celestium corporum pro nobis humanatum et non ex voluntate passum atque crucifixum?"

APPENDIX 55

MANUSCRIPTS OF WINANDUS, GLORIA MUNDI

CLM 455, 15th century, fols. 98r-104r: "In nomine domini nostri Ihesu Christi vocatur liber iste gloria mundi liber solis liber luminum et liber quinque clavium virtutum et grece dicitur Stoyce (*sic*) id est liber divinitatis sed apud Sarracenos dicitur Ysmahel id est liber secretorum. . . ."

S. Marco fondo antico 323, 15th century, fols. 156v-162v: "Hic incipit operatio veri et perfecti lapidis rebis que operationes extracte sunt de libro perfecti magisterii. Recipe in nomine domini ipsum corpus . . ."; fol. 160r, "Explicit primus liber magistri Wynandi. Quicumque hoc opus nostrum breviare voluerit . . ."; fol. 162v, ". . . cum suo pondere barnaas (?) crudi. Explicit textus nobilissime artis magistri Wynandi." At fols. 201v-206v, Wynandus occurs again, part in German and part in Latin.

Wolfenbüttel 3107, 15th century, fols. 31r-42: "In nomine domini nostri ihesu christi et eiusdem virtute nominatus est iste liber Gloria mundi lux solis. Hic incipiunt operationes vere et perfecte lapidis Rebis que operationes extracte sunt de libro perfecti magisterii et iste liber vocatur etiam clavis celestis et liber lumen luminum et liber quinque clavium virtutum et grece dicitur Theoslice (*sic*). . . ."

Wolfenbüttel 3786, 15th century, paper, fols. 50r-73v (old numbering, 61r-84v): Gloria mundi vel lux solis auctore Wynando de Ruffo Clipeo, "In nomine dei nostri Ihesu Christi et per virtutem eius Incipiunt operationes vere et perfecte lapidis rebis que operationes extracte sunt de libro perfecti magistri quoniam liber iste nominatur gloria mundi. . . ."

Cassel Chem. Folio 10, fols. 29v-35r: "In nomine domini nostri Iesu Christi et per eius virtutem nominatus est iste sequens liber gloria mundi lux solis. . . . Hic incipit . . . / . . . Et ille mercurius sic tinctus quod ulterius non tingit in se ipso tingit adhuc in corporibus tantum quantum ipsius est mercurii. Et sic de singulis gradibus. Et sic est finis."

Cassel Chem. Octavo 20, leaves unnumbered: "Hic incipiunt operationes vere et perfecte lapidis rebis . . . / . . . secundum gradus et modum et pondere barnaas ubi spissitudo olei in gradu illo tibi evenerit."

For BL Ashmole 1450, 15th century, fols. 18r-23v; and CU Trinity 1151, 15th century, fols. 36-45v, see DWS No. 232, where, however,

the work is ascribed to Arnald of Villanova. But in Ashmole 1450, fol. 18r, we read, "Ego Wimandus medicus minimus philosophorum dictus de rupho clipeo. . . ."

DWS I, 105, lists under No. 114, "Rhazes. Lumen luminum minus et perfecti magisterii, in three parts," a "Version by Wynandus" which would seem from the description to be identical with our *Gloria mundi.*

Klagenfurt Bischöfliche Bibliothek XXIX.d.24, 1421-1423 A.D., fols. 215r-261v(?): No author is mentioned. Liber qui vocatur Lux mundi et gloria solis, opening, "Nihil aliud dicam nisi quod oculis meis vidi. . . ." These words occur in the course of the first page after the mention of Wimandus's name in Ashmole 1450, fol. 18r. Our work apparently ends long before fol. 261v, since at fol. 239v we read, "Explicit fermilio magistri Iohannis Cro.," and recipes of John of Siena and a Practica of Arnald of Villanova follow at fols. 246r and 251v.

Boncompagni 3 appears to contain the Gloria mundi judging by Steinschneider's description in the Vienna *Sitzungsberichte* 149 (1904), 30.

BU 747(1492), fols. 89v-97v, described in our Chapter 53, note 33, is possibly the Gloria mundi.

APPENDIX 56

HEADINGS OF CONRAD HEINGARTER'S WORKS

A. TRACTATUS DE COMETIS

From BM IB 38108, fol. 1r-v.

The numbers in the column to the left indicate where the corresponding captions occur in the text.

Prima pars est sermo universalis

fol.

1v De generibus cometarum
De generationibus cometarum
2r Adductio aliquarum rerum quarum similitudine cometarum substantie a superioribus suas proprietates et naturas recipiunt
Quomodo cometarum substantiis et similibus acquiritur virtus celestis similis vi seminali
2v De motu cometarum
3r De figura colore et quantitate cometarum
Enumeratio singularum specierum cometarum prout ab antiquis determinatum est

3v De cognitione cometarum a posteriori sive quia est
De cognitione cometarum a priori et propter quid
4r (Quomodo inveniatur magnitudo cometarum)[1]
Quomodo substantie cometarum et similes habeant inmutare corpora et spiritus virtutum et inducere egritudines et mortalitates
4v Quomodo comete efficiant mortem subitaneam
Quomodo potentia cognitiva inmutetur ex substantiis cometarum et sibi similibus
5r Quomodo ex inclinationibus et moribus novis nove oriuntur leges et consuetudines et abrogantur veteres
5v Quomodo oriuntur secte prophete et alienarum rerum culture
6r Quomodo effectus comete et applicationum astrorum multis annis postquam transierunt durant
6v Quomodo aliqui effectus non durant longo tempore post cometarum apparitionem
Summa omnium dictorum
De modis significandi cometarum
7v De significatione cometarum ex situ quantitate duratione raritate et densitate
De significatis specialibus singularum specierum cometarum iuxta sententiam antiquorum sapientum
8r Summa et ordo significatorum cometarum

Secunda pars est sermo particularis
De cometa apparente Anno domini
milessimo quadringentesimo septuagesimo secundo

Prohemium

8v De oppinionibus quorundam prenosticantium de presenti cometa
9r De consolationibus[2] in quibus fundantur significata comete
9v De motu comete
De motu caude ipsius
10r De distantia comete a terra
De magnitudine comete
De longitudine caude

[1] This heading, omitted from the table of contents, occurs in the text.

[2] In the heading in the text this word is more correctly given as *constellationibus.*

10v De cognitione nature et proprietatis comete a posteriori ex motu figura et colore
De cognitione nature et proprietatis a priori ex configurationibus astrorum
11r De significationibus generalibus comete
De mortalitate ex egritudine
De mortalitate per gladium et de effusione sanguinum
De hiis quibus adversa fortuna minatur
11v De hiis quibus prospera fortuna connivet
De significatis specialibus comete et primo de privatione iurium et privilegiorum
12r De novis consuetudinibus et ordinationibus
Summa significationis comete
12v De moribus hominum

B. NATIVITY OF JEHAN DE LA GUTTE

Chapter headings as given through the text in BN 7446.

fol.

1v Capitulum primum prime partis est de dispositione celesti hora qua natus fuisti, necnon de his que ex illa celi dispositione in tuam animam in tuum corpus naturaliter impressa sunt tam de bono quam de malo
2v Capitulum 2m de duratione vite
4r Capitulum tertium de statu parentum
4v Capitulum quartum de statu fratrum
5r Capitulum quintum de statu corporis
6v Capitulum sextum de statu anime
7r Capitulum septimum de fortuna in divitiis
7v Capitulum octavum de honoribus atque nati dignitatibus
Capitulum nonum de magisterio et opere tuo
8r Capitulum decimum de coniugio
8v Capitulum undecimum de pueris nati
9r Capitulum xii de amicis et inimicis tuis
9v Capitulum tredecimum de servis
Capitulum xiiii de peregrinationibus
10r Capitulum xv et ultimum de morte
Ad secundam partem accedamus nunc foeliciter
10v Capitulum primum huius secunde partis et est de distinctione vite secundum septem etates que planetis attribuuntur
12r Capitulum secundum de directione hileg acceptum ab ascendente pro accidentibus in corpore tuo eventuris
Secuntur tabule
13r Capitulum tertium de directione hileg acceptum a parte fortune pro rebus pertinentibus ad divitias tuas
Capitulum quartum de directione hileg acceptum a luna
13v Capitulum quintum de directione hileg acceptum a sole pro tuis honoribus et dignitatibus
Capitulum sextum de directione gradus medii celi ad sciendum quando accidet fortunium et infortunium in tuo magisterio et officio ac filiis et amicis tuis
14r Capitulum septimum de signo perfectionis et domino firdarie

C. THE ADVICE TO JEHAN DE LA GUTTE

Combined from a descriptive statement at BN 7446, fol. 16r, and headings for the second book scattered through fols. 23r-31r and reduced to briefer tabular form.

Pars prima. De prescientia rerum agendarum utpote que negotia singulis quibusque annis sint suscipienda ac subeunda et que refugienda
Cap. 1 Tuam exponit radicalem complexionem cum regulis . . . observandis
Cap. 2 Describet tabellas astrologicas maxime tibi frugiferas per quas singulis quibuslibet annis providere poteris rerum tuarum agendarum fortunium atque diffortunium
Pars secunda. De conservande ac acquirende sanitatis regimine
Cap. 1 De regimine concernente aeris electionem et habitationis (fol. 23r)
Cap. 2 De tempore quantitate qualitate et modo exercitii (fol. 24r)
Cap. 3 De regimine cibi et potus (fol. 25r)
Cap. 4 De modo quiescendi post cibum sumptum. Et de modo atque utilitatibus somni (fol. 28r)
Cap. 5 De accidentibus anime que sunt ira gaudium timor tristitia et similia (fol. 30r)
Cap. 6 De cura adhibenda in sumptione medicinarum laxativarum et de regimine sanitatis (fol. 31r)

D. THE PREDICTION FOR 1476

Heingarter divides his prediction for the year 1476 into four parts according to the four seasons as was often the custom in such treatises. Under each season he treats of the following matters:

1 de causis
2 de terrarum locis
3 de inceptione atque duratione eventuum
4 de rebus magis huic influentie aptis
5 qualis res in generali accidet
6 in speciali aeris dispositiones per singulos menses

E. THE ADVICE TO THE DUKE OF BOURBON

In what follows I have reduced Conrad's descriptive statement of the treatise's contents (BN 11232, fols. 2r-3r) to a briefer tabular form.

Volumen I. De causa efficiente celesti tuarum infirmitatum *Cap.*

1 De causis efficientibus celestibus tuarum infirmitatum in universali
2 De utilitate scientie astrorum et quod sit medicis proficua et necessaria
3 De tuorum morborum causis celestibus in speciali
4 Quos morbos celi significatores influant et quibus temporibus
5 De membris magis dispositis ad infirmitates capiendas
6 Quod membrum, quem humorem quilibet planetarum regat
7 De temporibus componendi atque administrandi medicinas

Volumen II. Cura tam preservativa quam cum actu in paroxismo fueris

Differentia prima. De regimine preservativo

1 De compositione et destructione corporis humani
2 Quid sit arthetica et de eius causis quantum ex inferiori radice
3 De sex rebus sanitatem conservantibus ut sunt aer, cibus et potus, motus et quies, inanitio et repletio, somnus et vigilia, et animi accidentia
4 In quietando materiam ne ruat
5 In confortando et stringendo et exsiccando loca lesa et debilia et capita venarum stringendo ne tales materias accipiant
6 In divertendo tales materias crudas et fluxibiles

Differentia secunda. De regimine cum dolor actu effuerit

1 De hiis que in paroxismi principio augmento ac statu fieri debent
2 De hiis que in morbi declinatione sunt facienda
3 De membrorum et iuncturarum post morbum confortatione
4 De imaginibus astrologicis pro arthetica componendis
5 De illis que a proprietate occulta operantur et empericis.

F. DEFENSE OF ASTROLOGY

Wickersheimer, *Les médecins de la nation anglaise,* 1913, p. 39, states that a *Defensio astronomie* which existed in a MS at Zurich in the 16th century has not come down to us, but Zinner 4084 lists Zurich 244, 1488 A.D., fols. 1-4.

APPENDIX 57

GEORGE OF TREBIZOND: AUTOBIOGRAPHICAL PASSAGE: LATIN TEXT

From Vatic. Reg. Suev. 1098, fols. 3v-4v.

Neminem credo fugit eorum qui me norunt grecum me esse et insula Creta natum atque inde uxore ducta simul cum ipsa et liberis iam triginta quinque ferme annis per alienas nationes proculque a patria invitum errare. Quis enim patriam ubi natus ubi educatus unde (fol. 4r) uxorem duxit ubi suos habet libens relinqueret? Reliqui tamen invidia nonnullorum et quidem potentium superatus, abiique cum uxore ac unica tunc filia Vincentiamque conductus legi annos ferme duos. Inde quoque conspiratione aliquorum abire coactus Venetias petii duodecim circiter ibi annos vixi equitate credo iustitiaque illorum hominum diutius quam innata infelicitas mea pateretur. Cum igitur inde quoque recessissem Bononie transiens annum ferme moratus Florentiam veni et triennio post Romanam sequi curiam in rerum (a word seems missing here) pulsus anno domini 1452 a papa Nicolao quinto ad cuius honorem Matheum Chrysostomi, evangelicam Eusebii doctrinam, Iohannem Cyrilli, libros Aristotelis de animalibus, leges Platonis, Ptolomei magnam compositionem que vulgo Almagestus appellatur, Athanasium et Basilium, Nazazeni Gregorii multaque preter hec minuta volumina e greco in latinum traduximus. Exacti Roma sumus quia non patiebamur tot tantaque summo labore nobis edita partim in Pogium Florentinum partim in Iacobum Cremonensem transferri quam indignissimam rem atque inauditam non auderemus dicere nisi eam aperte ostenderent scedule manu (fol. 4v) Iacobi Cremonensis conscripte et in commentariis nostris iussu ipsius Nicolai quinti affixe mihique ab ipso turpiter misse. Quod cur fecerat inde patet quod cum per epistolam que extat a me sibi fuerat supplicatum ut nollet labores meos in alios transferre velletque me a vexatione quam acerba huius rei memoria faciebat liberare, respondit obediendum mihi esse aliter faceret ut nullius rei possem in posterium recordari quod oraculum per episcopum edidit

Perusinum. Hec sive per se cogitarit sive per alium suggesta sibi fuerit nescio. His minis et maxime carcere atque vinculis quibus me afflixit perterritus illico Neapolim versus abii ubi Alfonsus rex Aragonum et utriusque Sicilie inclytus tam verbis quam rebus humanissime quod innatum sibi est me suscepit.

APPENDIX 58

GALEOTTO MARZIO, DE INCOGNITIS VULGO: HEADINGS

From BN 6563.

fol.

2r Capitulum primum que differentia est inter teologos et philosophos de materia prima et eius divisione et de chao et forma et multis aliis

3v Capitulum secundum de intellectu agente et possibili ubi reprehenditur maximus error philosophorum Stoicorum

4v Capitulum tertium de religionis necessitate propter varias hominum opiniones et propter dictum Averois de unitate intellectus

5v Capitulum quartum de immortalitate anime que non potest ratione probari et quod Aristotelis et Platonis rationes non sunt efficaces ad anime inmortalitatem demonstrandam in qua opus est ad fidem recurrere

8v Capitulum quintum. Quid sit fides et in quibus rebus consistat et est disputatio an unusquisque non habita cognitione fidei cristiane possit in fide sua salvari

17r Capitulum sextum. Que ratio induxerit philosophos ut dicerent in deo esse patrem et filium et quoddam medium que nos vocamus trinitatem

fol. *Cap.*

20r 7. Qua ratione homo dicitur ad imaginem et similitudinem dei factus cum inter se maxime discrepent ubi cognoscitur differentia inter imaginem et similitudinem

21r 8. Quomodo operatur trinitas si tota simul vel si divisim ubi quedam similitudo gentilium cum observatione cristiana enumeratur

23r 9. Que adoratio debeatur trinitati ubi et latria et dulia et hiperdulia declarantur et que obligantur scientie adorationum genera et quod non peccatur in adoratione imaginum

25v 10. Quod ignorantia est maximum peccatum et quod omne peccatum ab ignorantia est etiam in his qui sciunt et cognoscunt se peccare et quod regum et rerum publicarum delicta gravissime puniuntur

29r 11. Disputatio an in hac vita possit esse letitia et tandem declaratur quod nemo possit letus nisi bonus

30r 12. Que differentia sit inter theologos et philosophos de beatitudine

31r 13. Que differentia sit inter catholicos et philosophos de acquirenda beatitudine ubi probatum beatitudinem nisi fuerit a deo predest (*sic*) inatus

34v 14. Quod non est verum verbum Christi pervenit in omnem terram irridentur et confutantur rationes Lactantii negantis terram esse rotundam nec posse antipodes reperiri

37v 15. Quod Scotus doctor subtilis erravit cum quibusdam mimicis argutiolis putavit predesti(n)antes et prestitos damnari posse

39v 16. Quod quidam theologi non bene opinati sunt qui habitum virtutum a deo dari et actiones secundum virtutem a nobis proficisci censuerunt

40v 17. Quod preces humane nichil valent nisi concordent cum voluntati divina et rebus sic stantibus quare obligamur preces effundere

42v 18. Si sancti et christus ordinati sunt ut intercedant pro nobis

44r 19. Quod hi qui scirent se esse damnatos orare et deum laudare ratione philosophica obligantur

45v 20. Quod vita non potest neque brevior neque longior fieri et quod tam diu durat quamdiu datum est desuper probatur re sic se habente necessarium esse medicandum

50v 21. Quod male interpretantur quidam illud Ciceronis in philippicis de natura et fato et quomodo interpretandum sit

52v 22. Quod in rebus humanis nulla sit in nobis potestas sed tota ex astris a deo pendentibus ubi genitura octaviana astrologice supputata ostendit quid antiquos mathematicos moverit ut magnitudinem octaviani prenuntiarent et quomodo intelligitur Suetonius cum dixit Augustum sidere capricorni natum

57r 23. Confutatio rationum beati Augustini contra mathematicos ubi demonstratur quod Jacob et Esau licet sint editi uno fere tempore potuerunt esse diverse sortis ubi et vana scientia Plinii in quibusdam et error Platonis ostenditur

62r 24. Quod prophete plerumque vident minas et non effectum rei ut de innocentibus pueris et ubi fit mentio in historiis de hiis

63v 25. Quod illi qui venerunt ad Christum magi non fuerunt reges et ubi apud gentiles mentio sit de illo cometa qui duxit magos

64r 26. Quanta distantia sit a terra ad firmamentum et quot annorum milibus totum celum intuetur quinquaginta milia passuum uno die facienda

66v 27. Quod non licet viris literatis neque pro doctrina neque pro auxilio neque consilio quicquam accipere nisi ad victum et vestitum

69v 28. Quod elemosine magis minusve valent pro ut anime sunt in charitate et non his pro quibus dantur ubi sanctus Tomas ostenditur non omnino bene sensisse

71r 29. Quare necessarium fuit quod Moses et Christus mittuntur a deo

72v 30. De excellentia fidei christiane ubi de iudaica et sinacho sectis cum reprobatione fit mentio ubi auctor letatur se in fide christiana initiatum et educatum fuisse

75v 31. De multis sundibris(?) in fide et secta gentilium ubi est protestatio quod totus liber subicitur ecclesie catholice.

APPENDIX 59

AN ANONYMOUS DE COMETA OF 1468: HEADINGS

MS BN 7336, fol. 373r-v.

1 de quiditate ipsius comete
2 utrum hoc anno 1468 currente debuit apparere cometes
3 utrum istud signale modo apparens est cometa
4 quid genus cometarum est hoc
5 de variis generibus cometarum et per consequens demonstratio huius cuius generis cometarum sit
6 unde facta est
7 utrum est causa vel effectus (fol. 373v)
8 conclusio erit in quo differunt comete et quare non semper apparent comete
9 quare non apparent plures
10 quare diversa forma videtur in cometis et quare non est una

11 utrum solummodo a quinque planetis nascitur
12 quod cometes non est stella erratica (nec fixa sed flamma)
13 quod cometes vel cometa non in una parte celi aspicitur
14 utrum oritur et occidit quemadmodum alie stelle
15 de motibus cometarum iuxta genera ipsarum
16 de significatione huius comete in generali
17 de significatione eius in speciali
18 ad quas partes mundi effectus venit
19 quando effectus venient significati per hunc cometem
20 quantum durabunt effectus ipsius

APPENDIX 60

JEAN MICHEL

The contemporary poet, André de la Vigne, who was also secretary to duke Amadeus of Savoy and to the queen, Anne of Brittany, and who accompanied Charles VIII on the Italian expedition, states, in his *Vergier d'honneur* that the royal physician, Jehan Michel, died at Chieri near Turin on the return from Naples on August 22, 1495, and that, when the king became indisposed at Grenoble on the October 27th following, he had to seek other physicians. Evidently the 1493 of Renaudet and Chevalier is a misprint. But Célestin Port found evidence in the municipal archives of Angers (*Inventaire analytique des Archives anciennes de la mairie d'Angers*, 1861) that Jean Michel died in 1501. Moreover, Chéreau adduced letters between Charles VIII and those left in charge of the young dauphin, Charles Roland, which show that Jehan Michel was one of the physicians in charge at Amboise in the very August when he is said to have died near Turin. Chéreau ("Jean Michel de Pierrevive, premier médecin de Charles VIII, roi de France, et le mystère de la passion," *Bulletin du bibliophile*, 1864, pp. 776-797) therefore concluded that there must have been two Jean Michels, both royal physicians, one, called de Pierrevive, who died in 1495; the other, of Anjou, who lived until 1501. Chevalier therefore should have listed this article of Chéreau under both Jean Michels instead of merely under the one (de Pierrevive) who, he says, died in 1493 (i.e. 1495). Chéreau further states that Jean Michel de Pierrevive left a daughter, Marie Michelle, but does not entertain the possibility that the other Jean Michel may have been his son. He notes that the records of the university of Paris for 1472 mention a "Iohannes Michel, Normannus" and also "bursarius medicine" (see Wickersheimer, *Commentaire de la*

faculté de médecine, 1915, pp. 258, 264, 269, etc.) in the Collège de Maître Gervais, and asks, "Which Jean Michel is this?" The fly leaf of BN 7482 shows that he was the one who was still alive in 1498. But is it necessary to postulate these two Jean Michels? May not André de la Vigne have remembered incorrectly the name of the royal physician who died on the Italian expedition and confused him with Jean Michel? Against this supposition, however, is a royal letter of July 12, 1497 referring to the marriage of the daughter of "the late Jean Michel": see *Lettres de Charles VIII,* ed. P. Pélicier, V(1905), 143. But the same letter with the same reference to Jean Michel is reprinted in the *Supplement* to the same work as of July 12, 1490: *Ibid.,* p. 238. Jean Michel would appear to have had as many lives as a cat.

APPENDIX 61

PAOLO ORLANDINI AGAINST ASTROLOGY

With the work of Pico della Mirandola against astrology may be associated the less celebrated treatise of Paolo Orlandini, a Camaldulensian, to whom Mehus refers several times, calling him a Florentine[1] and a disciple of Ficino, who records in a letter of November 13, 1496 to Paolo a discussion in which they had recently engaged as to the priority of the intellect and the will.[2] This shows that Pico was not the only associate of Ficino to attack the astrologers. Orlandini died in 1519. Whether his *Liber satyricus de notitia futurorum contra astrologos* (*A Satire on Knowledge of the Future Against Astrologers*) was written before or after 1500 seems uncertain. Citations from Politian make it probable that the work was later than that of Pico, to which, however, it seems not to allude. The extant manuscript of it bears the date, October 20, 1514,[3] but this may be the date of that copy rather than of the original composition. Reference is made in the text to an astronomer of Cremona having predicted—apparently recently—the birth of antichrist for 1505 and his recognition by all races by the year 1530, but this does not enable us to date either the year when the

[1] Orlandini himself corroborates this by his referring to the Florentines as his fellow citizens in the work which we are to consider. See cap. 16, fol. 26, of the MS to be cited in the third footnote: "Quod utinam mutuari cives mei Florentini possent in sua urbe."

[2] Cited by A. Della Torre, *Storia dell' Accademia Platonica,* Florence, 1902, p. 832, from Ficino, *Opera,* II, 1425.

[3] FL Ashburnham 1875, 16th century, paper, original binding, Pauli Orlandini Camaldulensis Liber satyricus de notitia futurorum contra astrologos. 104 fols. On the last page is written: "in monasterio S. Michaelis de Muriano de Venetiis, die xx octobris MDXIIII."

Cremonese astrologer composed his prediction or that when Orlandini penned his attack. Battista Piasio of Cremona was a professor noted for his annual almanacs, but he died in 1492.

This prediction raised four questions in Orlandini's mind: whether we can foresee future human and contingent actions by the course of the stars, whether man is subject to the influences of the stars, whether religion is subject to the stars, and whether the coming of antichrist is thus predictable? But his book is full of digression and of classical allusions and citations so that we do not reach the second question until the twenty-sixth of its fifty chapters, the third until the thirty-fourth, and the fourth until the forty-first. He grants that the stars impress all terrestrial bodies even unto the sensitive soul but affirms that the rational soul is superior to their influence. It is, however, denied that critical days in disease are to be referred to the moon. Various chapters are devoted to demons and their knowledge of the future, and to such other occult arts or phenomena as physiognomy, chiromancy, magic, lot-casting, augury, auspices, portents, dreams, and genii. In these chapters Orlandini seems merely to embroider Isidore's account of the magic arts. Between the chapters on chiromancy and superstition is one on experience, suggesting the association between magic and experimental science. Aristotle's doctrine of intelligences moving the spheres is accepted. Fate and providence are discussed. Those who scorned fate are represented as triumphing over those who observed it. The astronomer of Cremona had cited Roger Bacon and Pierre d'Ailly for prediction of religious events from the stars, but Orlandini opposes their views. After his four questions have been answered he advances some further trite arguments against astrology such as that the number of the celestial bodies is uncertain. He condemns the ancient Egyptians and Chaldeans as very superstitious and as diviners rather than scientists. Abraham, however, taught the Egyptians calculation not divination. The work closes with chapters on true wisdom and spiritual activity. On the whole, it seems an amateurish and shallow performance touching on a number of old topics in a rather superficial way, its only at all novel feature as an attack on astrology being the classical ornamentation and affectation of the age of Italian humanism.

APPENDIX 62

JEROME OF SANCTO MARCHO

A brief treatise concerning the machine of the universe and meteorological impressions by brother Jerome of Sancto Marcho of the order of

Friars Minor, as a student of theology at Paris, was printed in the early years of the sixteenth century.[1] Its colophon states that Jerome compiled it in the dear university of Oxford[2] on the ninth day of October, 1505.[3] It was apparently printed almost immediately afterwards. There is, however, some difficulty about a student at Paris compiling a treatise in Oxford and in accepting this date for the composition of the treatise, since the sole known Jerome of Sancto Marcho appears to have been an Italian Franciscan of the fourteenth century. Wadding and Sbaralea described him as an Oxford bachelor of arts who flourished about 1330 and wrote a treatise in logic.[4] Wadding regarded him as an Englishman, but Sbaralea pointed out that Sancto Marcho is located in Calabria in southern Italy. It should be noted, however, that our author Jerome gives illustrations from English history and the Norman conquest in speaking of the effects of comets in his treatise.[5] The work does not quite sound as if it were composed as late as 1505, since it follows the thirteenth century treatise of Sacrobosco concerning the division of the habitable world into four parts, and regards the region for twelve degrees north of the equator as too torrid for habitation.[6] However, such backward views might still be found in 1505. The work is dedicated to the venerable father, friar James of Capua of the Minorite order,[7] which further suggests an association of Jerome with southern Italy, and also expresses gratitude to Flemish merchants who have assisted Jerome financially with his education. Unfortunately James of Capua seems otherwise unknown,[8] and so the dedication to

[1] I have examined the work at the J. Pierpont Morgan Library. It is described in the Morgan catalogue, III, 761, as printed at London by R. Pynson in 1505. The title page reads: "Opusculum de universali mundi machina ac de metheoricis impressionibus a Fratre Ieronimo de sancto Marcho ordinis minorum et in sacra theologia studente Parisiense editum ad mentem Aristotelis necnon aliorum philosophorum peritissimorum."

[2] "in alma universitate exoniense," but *Oxoniense* is presumably intended. Or perhaps it is a misprint for *Parisiense* or vice versa.

[3] The figures look like ihoh, but presumably the two h's are the old character for five printed upside down.

[4] *Scriptores ordinis minorum,* editio novissima, Rome, I (1906), 117; II (1908), 368.

[5] At fol. xvi verso.

[6] Fol. xi recto.

[7] "Venerabili patri fratri iacobo de capua ordinis minorum. . . ." These words open the dedication. "Universalis mundi machina in duas partes principales dividitur . . ." is the incipit of the text proper.

[8] He appears to be mentioned neither by Wadding nor Sbaralea, and is also found wanting in Chevalier. Neither he nor Jerome of Sancto Marcho appears in the index of Renaudet's detailed study of intellectual conditions at Paris in the years 1494-1517; *Préréforme et humanisme à Paris,* 1916.

him does not assist us in dating the work. Since it may be by the fourteenth century author and seems to be little known, I have not wished to omit it entirely; and since it may have been composed after 1500, I have relegated it to an appendix.

Jerome's little treatise covers some twenty-nine or thirty leaves and divides into two parts. The first consists of chapters concerning the heavens and the elements. The second part deals with meteorological impressions in five chapters devoted respectively to fiery phenomena, such as comets; moist phenomena, such as rain and dew; subterranean phenomena; fourth, phenomena of the sea, winds, earthquakes, thunder and lightning; fifth, and last, such phenomena as the halo and rainbow together with a consideration of the generation of minerals, although this would seem more properly to belong under the third head. Albertus Magnus is cited a good deal, and his explanation of the galaxy or Milky Way, which our author says is called "the path of St. James" by the peasants,[9] as composed of a large number of stars in the eighth sphere, is adopted as superior to the views of Pythagoras, Anaxagoras, and Democritus, or to that of Aristotle that the galaxy consisted of dry, hot exhalations from inferiors rising to the highest region of the air and there receiving the light of the stars. Our work, however, was described on the title page as following the thought of Aristotle and of other skilled philosophers.

The views of Jerome concerning the origin of springs and fountains[10] and the formation of mountains[11] may be worth noting as of some interest in the history of geology. He holds that springs never originate in plains nor in the midst of the sea, but only in mountains where there are large cavities in which the air is converted into water. It does not seem to occur to him that if springs were produced in plains they might form lakes, or that existing bodies of water have springs. He does not believe that running waters come either from the depths of earth or from the sea or from rainfall and snow.[12] His argument against the last source is that streams flow all the year round at times when there is no precipitation. He recognizes, however, that the sun, by means of evaporation, keeps the ocean from being increased in size by the influx of rivers.[13] His chief argument against the existence of springs in mid-sea

[9] "De galatia que a rusticis dicitur via sancti Jacobi," fol. xvii recto and verso.

[10] Fols. xx verso-xxi recto.

[11] Fol. xxiii recto.

[12] "Ex quibus patet quod aque fontales non fiunt ex tartaro neque ex mari neque ex pluvia neque ex nive."

[13] Fol. xxiv.

is that there are no mountains there; but he gives no reason why there should not be. He states that mountains may be formed either from tiny particles of soil carried by the winds, or by action of seas and waters, depositing land in certain places, or from earthquakes submerging portions of the earth and forming deep valleys. As Albertus Magnus says, any one of these three causes is enough to make a small mountain, and all together they make a large mountain.

There is a good deal of astrology in Jerome's treatise. He takes up the influences of the planets[14] and of the signs of the zodiac and the parts of the human body corresponding to each of the latter. He gives the signs of comets both "according to the philosophers,"[15] and "according to the astrologers."[16] Comets are signs of many ills: wars; mortalities, especially of princes; pests; changes of kingdoms or laws; or new religious sects. The beginning of Aristotle's treatise on physiognomy is cited for the argument that the mind follows the constitution of the body, and consequently comets lead to religious change. They also produce earthquakes. Such are the utterances of the philosophers. The astrologers are more specific as to the particular regions and kingdoms which the comets affect, and they distinguish nine different kinds of comets of which seven are related to the seven planets respectively.

The influence of the sky is also the efficient cause in the generation of gems within the earth, hardening and cooking the earth and corrupting its substantial form. Thus is introduced the marvelous substantial form and the marvelous accidents which gems possess to such an extent that the omnipotence of God does not appear more markedly in any inanimate objects.[17] The generation of metals within the earth is also governed by the influence of planets. They are formed from sulphur and quicksilver, but gold is produced from pure sulphur and quicksilver under the influence of the sun, silver from the same under the influence of the moon. Lead, tin, and copper are produced from gross sulphur under the influence of Saturn, Jupiter, and Venus, respectively. Iron is produced from gross sulphur and impure quicksilver under the influence of Mars. Quicksilver itself is produced from sulphur with a concurrence of the planet Mercury, which is cold and dry. Frankincense and sulphur, and similar easily inflammable substances, are generated

[14] Fols. iii verso-v recto.
[15] Fol. xvi verso.
[16] Fol. xvii recto.
[17] According to the table of contents at the close of the work the accounts of the generation of gems and of metals should be on fol. xxviii, but the leaf has been bound in wrong in the Morgan Library copy and numbered incorrectly as fol. xxvii.

by the evaporation of watery humour and by strong digestion of aerial humour with dry terrestrial. Our author appears to accept alchemy to a certain extent. In his closing paragraph he states that gold cannot be changed into silver or vice versa without corrupting it, and that the same is true of the change of any metal into another of another species. If it is contended that the alchemists change quicksilver to gold without corrupting it because they are then able to transmute the gold back into quicksilver, Jerome replies that if they make true gold, the quicksilver is corrupted; and that when the gold is transmuted back into quicksilver, the latter is not pure. If they simply make gold in appearance, it is true that the quicksilver will not be corrupted; but that is not a change of species, but of accidents only.

INDICES

GENERAL INDEX

(Only titles of books and periodicals are italicized.)

INDEX OF MANUSCRIPTS

INDEX OF INCIPITS

ERRATA AND ADDENDA

VOLUME IV

p. 23-24 Rather there are two texts with the title, *Elucidatio testamenti,* one printed by Manget in 1702 opening, "Quamquam plurimos libros . . .", the other found in the MSS (see infra, p. 636) opening, "Tu in virtute de . . ." Salzinger in 1721 called the latter *Lucidarium totius testamenti,* but the MSS call it *Elucidatio testamenti.*

p. 43, l. 21 Before *Liber* insert *Felix,*

p. 176, n. 106 Hubert Pruckner, *Studien zu den astrologischen Schriften des Heinrich von Langenstein,* 1933, pp. 8-9, lists MSS of 1374-1376 and 1393 in which a work with the same incipit is called "De improbatione epicyclorum et concentricorum" and ascribed to Henry of Hesse.

p. 303, l. 21 Concerning William de Luxe or Adeline see Hansen, *Quellen,* 467-472.

p. 308, n. 2 Only Hansen's work of 1900 lacks an index

p. 395, n. 20 For *1547* read *1549*

p. 413, n. 1 Celoria does collect such references to some extent

p. 430, n. 64 For *comete* read *cometa*

p. 483, l. 1 and p. 742 For *Pietromellaria* read *Pietramellaria*

p. 597, n. 9 For *Bartholomaeus Montagnana* read *Bartholomaeus de Montagnana*

p. 605, l. 19 For *Montagna* read *Montagnana*

p. 624 Opposite *Furnis* transpose *248* to the second column

p. 697, l. 4 For *Zurich 244* read *Zurich B 244*

p. 713 Under "Antonius de Monte Ulmi" omit "Chap. XXXV"

p. 718 Insert "Cato, Walter, 539"

p. 748 Insert "Stefan von Stinendia, 98"

p. 758 For *Zurich 244* read *Zurich B 244*

p. 763 Insert "Mundi parens primus dum sublunaria . . . 92"

p. 764 Insert "Quamquam id de quo paulo post . . . 92" and "Quamquam plurimos libros . . . 24"

p. 765 Insert "Reverendissimo atque illustrissimo . . . 425"

p. 766 Insert "Universalis mundi machina . . . 704"

p. 767 Insert "Venerabili patri fratri Iacobi de Capua . . . 704"